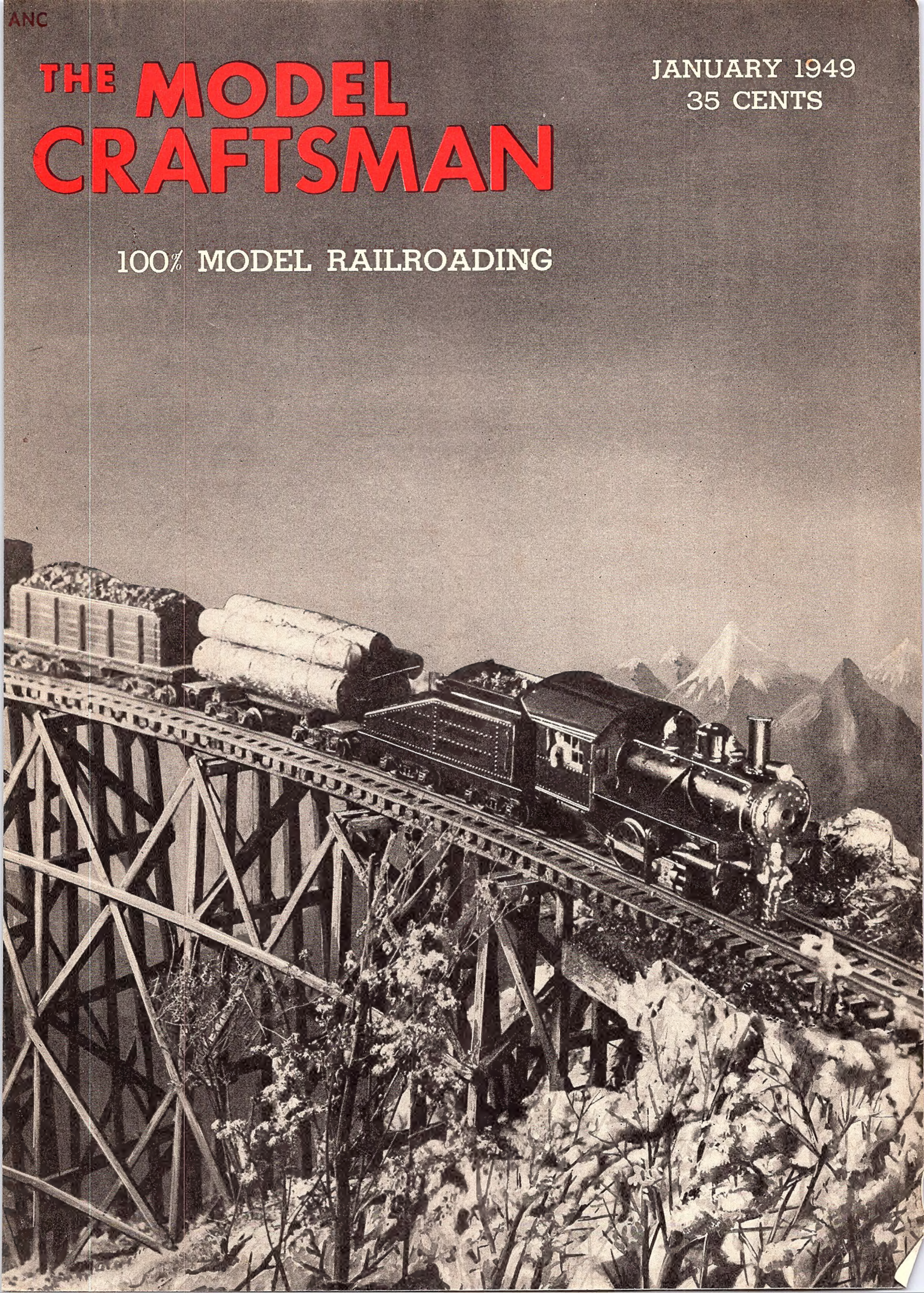
ANC

THE MODEL CRAFTSMAN

JANUARY 1949
35 CENTS

100% MODEL RAILROADING



"They prefer Varney HO kits, because"

GRAND PRIZE
(2 Diesel A Powered Unit Kits)
(2 Diesel B Powered Unit Kits)

WINNER	DEALER
Richard M. Einar, Jr. 2405 4th Avenue Seattle 1, Wash.	Hobby Craft The Bon Marche Seattle, Wash.

2ND PRIZE
(Varney Streamline Hudson Loco and Tender Kit)

WINNER	DEALER
Robert L. Dennis 9303 E. Jefferson Ave. Detroit 14, Michigan	Hobby Exchange 3248 Fenkell Ave. Detroit 21, Mich.

3RD PRIZE (TWO TIED)
(Varney Dockside Kits)

WINNERS	DEALERS
Walter A. Simpson Lt. Col. U. S. A. 1212 Trenton Place, S.E. Washington 20, D. C.	Newton Hobby & News 3109 Nichols Ave. S.E. Washington 20, D. C.
J. D. Buckman, Jr. Shepherdsville, Ky.	Fischer's Hobby Shop Louisville, Ky.

"My congratulations to the 104 winning hobbyists whose entries were selected on the basis of originality, uniqueness, and aptness of thought. And my heartfelt thanks to every single one of you who wrote me telling why you prefer Varney kits. We are more determined than ever to keep Varney design, Varney engineering and Varney value on top, and to keep all of you Varney fans happy."

Gordon Varney

Fourth to 103rd Prizes
(Varney Commemorative Freight Car Kit)

Winners and their Dealers

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R. M. Johnston Phoenix, Arizona	Webster's Hobby Shop Phoenix, Arizona
Virgil C. Holt Blytheville, Arkansas	The Hobby Center Memphis, Tenn.
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Don Stark Hollywood 28, Calif.	Hollywood Hobby & Elec. Shop Hollywood, Calif.
Angus MacDonald Lodi, Calif.	Hobby Craft Shop Stockton, Calif.
Jerry Clark Los Angeles 44, Calif.	Carl's Model Supply House Los Angeles 44, Calif.
H. D. Fitte Los Angeles 7, Calif.	Pice Model Co. Los Angeles 6, Calif.
Donald R. Latham Los Angeles 31, Calif.	Al's Hobby Shop Los Angeles, Calif.
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Thomas C. Kerr Santa Clara, Calif.	The Sportster Santa Clara, Calif.
Wm. G. Marden Santa Cruz, Calif.	Jack Garland Capitola, Calif.
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Kenneth Blume Lamar, Colo.	H & S Hobby Center Colorado Springs, Colo.
Robert C. Lorch Manchester, Conn.	Hobby Center Hartford, Conn.
John B. Van Why Winsted, Conn.	Hobby Center Hartford, Conn.
H. C. Martens Clearwater, Fla.	Model Railroad Equip. Corp. New York City, N.Y.
C. D. Osborn Largo, Fla.	Hulse Hobby Mart St. Petersburg, Fla.
Hugh Jordan Decatur, Georgia	Atlanta Hobby Shop Atlanta 3, Georgia
Ray Critchell Mountain Home, Idaho	Bon Marche Hobby Shop Seattle, Wash.
Henry E. Dieterle Chicago 36, Ill.	Ben's Hobby Shop Chicago, Ill.
Wm. A. Dohm, Jr. Elgin, Ill.	K. B. Appliances-Hobbies Elgin, Ill.
Robert Horten Moline, Ill.	Western Craft & Hobby Shop Davenport, Ia.
Archie C. Eddy Rock Island, Ill.	Western Craft & Hobby Shop Davenport, Ia.
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H. Donald Studabaker Whiting, Ind.	The K-D Sportshop Hammond, Ind.
Addison C. Kistle Council Bluffs, Ia.	Mac's Hobby Shop Council Bluffs, Ia.
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Captain Harold E. Cude Fort Riley, Kansas	Brown Music Co. Manhattan, Kansas
Boyce Martin, Jr. Anchorage, Ky.	Fischer Hobby Service Louisville, Ky.
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Richard A. Tully Brookline 46, Mass.	Boston Model Railroad Co. Boston, Mass.
Frank J. Griffin Rockport, Mass.	Crosby's Hobby Center Cambridge, Mass.

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Frank J. Hermann Hyattsville, Md.	Corr's Washington, D. C.
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Donald L. Mitchell Minneapolis, Minn.	Brown's Hobby Shop Minneapolis, Minn.
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VARNEY

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Douglas A. Roll Arlington, Va.	Corr's Washington, D. C.
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Edward L. Gibbon Richmond, Va.	Zephyr Miniatures Richmond, Va.
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Roger M. Perry Johannesburg, South Africa	The Central News Agency, Ltd. Johannesburg, South Africa

NOTE: 3,196 entries were received. 1,344 were ineligible, for one of the following reasons: no dealer listed; no Varney box end; late entry; more than 25 words; unsigned or no address. 1,852 were considered eligible.

RAILROAD CLUB NEWS

PORTLAND, ORE. The first annual convention of the Pacific Northwest Region of the NMRA was held here recently with attendance from all parts of the region. Seven Vice-Pres. were elected to office to govern each of the districts into which the region was divided: Stephen Donohoe, Portland; A. E. Eckersall, Rigby, Ida.; Dave Stearns; Russ DuCette, of Coulee Dam, Wash.; Tom Williams, of Billings; George Hearne, Victoria, B. C.; and Ken Watson, of Medford, Ore. Anyone in the vicinity interested in membership should contact their nearest V.-Pres. These seven men then elected Dave Stearns as the first President of the group with George Hearns first V.-Pres. and Steve Donohoe as Sec.-Treas.

Between events on the program, time was taken to visit the club layouts of the co-hosts, The Portland Society of MRR and the Columbia Gorge RR Club. Seattle was chosen as the location of the 1949 convention.

GALION, OHIO. The first train has passed over the tracks of the Kansas Central since moving two years ago. The layout is still far from complete since the brass hat is in the Marines—work is progressing satisfactorily under the direction of the trustee pres., C. G. Sebut. Cars are being delivered regularly and the board of directors (money) shows promise of ordering a complete streamline train in the near future. Anyone wishing to visit this layout is welcome any evening—contact the president at 131 Third Ave.

SEATTLE, WASH. In preparation for full scale operation of its newly constructed Puget Sound & Cascade R. R., the Seattle Society of Model Engineers recently elevated former Chief Engineer John Whistler to the post of President; C. W. Mendenhall, head of the affiliated Sawdust Valley R. R., was elected V.-Pres., and Elliott DeForest and Harry Terhune were continued as Secretary and Treas., respectively. The club sent a six-man delegation to the first regional meeting of the NMRA, including Dave Stearns, who was elected President of the region.

DETROIT, MICH. The North Central Regional Meeting of the NMRA will be held on the week end of Jan. 22 and 23, headquarters will be the Fort Shelby Hotel. The business meeting will be held on Sunday at 10 A.M, followed by Conference Clinics. The Detroit Model R. R. Club is the host.

BROOKLYN, N. Y. Recently the Bay Ridge Society of Model Engineers visited the Long Island MRR Club in Astoria, bringing with them various pieces of motive power which were run on the host's layout. Several of the Bay Ridge boys were acting as student operators upon the various boards under the tutoring of the Astoria fellows. Refreshments were served and colored movies of

(*Continued on page 49*)

DOES YOUR RAILROAD HAVE A HIGH ACCIDENT RATE ?

ARE YOU TROUBLED WITH DERAILMENTS, SHORTS, HOT BOXES ?

YOU CAN ELIMINATE 90% OF THESE TROUBLES WITH *Silver Streak's*

NEW SPRUNG & EQUALIZED TRUCKS!

TROUBLE FREE OPERATION Silver Streak trucks practically put an end to annoying de-railments because they're built on the same principle as real railroad trucks. The **REAL WORKING SPRINGS** absorb the irregularities of rough track work, loose spikes and loose-fitting switch points. They hug the high iron like a magnet.

Silver Streak trucks are **PERFECTLY GAUGED.** All wheel dimensions are held to the closest tolerances possible on new, modern automatic equipment—tolerances that are measured in fractions of a thousandth of an inch. Each wheel must be **PERFECT** or it goes in the reject box!

Silver Streak trucks have **PERFECT WHEEL CONCENTRICITY.** Total run-out is held to less than one thousandth of an inch! And, because Silver Streak uses the new dielectric coating process for insulating for two rail, the wheels **STAY CONCENTRIC.** No plugs or bushings to work loose or wear out of shape. Insulation is tested at 110 volts, too, to guarantee against any possibility of shorting out.

Silver Streak trucks are the **ROLLINGEST** trucks you'll ever see! Their needle-point bearings reduce friction to a minimum. Axles are GROUND, not turned on a lathe. You can pull long strings of cars with lightest motive power if **ALL** your rolling stock is equipped with these **SUPER TRUCKS.**

Silver Streak trucks have the finest detail obtainable because they're scaled down from the prototype trucks. Black oxidized, too. You don't even have to paint 'em!

VARIETY For your box cars and reefers, there's the Bettendorf type. You'll want the Andrews trucks for your tank cars, hoppers and gondolas (used on box cars, too). For old-time cars, there's the Arch-Bar. For cabooses, a real sprung caboose truck with leaf springs to give your freight crew an easier ride. Also tender trucks with leaf springs (Andrews and Arch-Bar).

PRICE $1.10 PAIR

(Cost no more than high quality dummy trucks)

LEADING DEALERS EVERYWHERE STOCK SILVER STREAK TRUCKS AND ROLLING STOCK.

ASK YOUR hobby dealer to show you these superior trucks. Twist 'em; press 'em; roll 'em. Convince yourself that they make all other trucks obsolete. Put 'em under your cars and notice the difference in operation as well as appearance.

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THE WORLD'S MODEL RAILROAD SHOW WINDOW

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O GAGE

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—Scale Diesel Switcher $29.95
—Tinplate Diesel Switcher 35.00
—Pacific 67.50
—Atlantic 59.50
—Ten Wheeler 54.50
—Morrell's Pride Reefer 4.90
—Dry-Ice Reefer 4.90
—Lackawanna Reefer 4.90
—Western Fruit Express 4.90
—Drop Center Flat Car 4.90
—Pacemaker Box Car 4.50
—Union Pacific Box 4.50
—B & O Box Car 4.50
—Pennsylvania Box Car 4.50
—Gulf Mobile & Ohio Box Car 4.50
—Modelmaster (GMC) Caboose 7.50
—Thomas 0-4-0 Tinplate Switcher 39.50
—Thomas 0-4-0 Scale Switcher 39.50
—Thomas Tank Car 5.95
—Railcraft Standard Hopper 5.00
—Railcraft Offset Hopper 5.50
—Walther's 0-6-0 Switcher 69.75

Great Western Old Time Locos
—0-4-2 Switcher 49.50
—4-4-0 American 59.50
—2-8-0 Consolidation 71.50
—2-6-0 Mogul 65.50
—Lobaugh Berkshire 128.50
—Lobaugh Pacific 118.00
—Lobaugh Tank Car 10.95
—Lobaugh #1 Motor 10.00
—Lobaugh #2 Motor 11.00
—Lobaugh #3 Motor 12.00
—Wentzco Diesel A&B complete 117.50
—Hines Mikado 80.00
—Hines 0-8-0 Switcher 70.00
—Atwater Diesel A Powered 49.50
—Atwater Diesel B Powered 44.50

Stewart Lundahl
—Penna-Union Line 35 foot Box 6.75
—Pennsylvania 35 foot Box Car 6.75
—Penna. Co. 35 foot Reefer 7.00
—WB & A Articulated Car Kit 6.50
—C.E.R.A. Freight Trailer 3.00
—#1 K & D Motor 3.81
—#2 K & D Motor 5.10
—#3 K & D Motor 6.35
—#4 K & D Motor 7.60

Kasiner Streamline Cars
—18 Roomette 8.95
—24 Duplex Roomette 8.95
—N. Y. C. Coach 9.95
—Baggage Mail 8.75
—Dining Car 8.95
—Baggage Coach 9.95
—Observation (Smooth Side) 12.50
—Observation (Corr. Side) 12.50
—Astra Dome 11.95
—Pullman Sleeper 9.95
—Miniature Street lights (14v) ..... .79

Great Western Old Time Cars
—Tank Car 5.25
—Flat Car 4.75
—Sway Belly Gondola 4.75
—Sway Belly Hopper 4.75
—Baggage 6.50
—Combine 6.50
—Coach 6.50
—Westbrook Gondolas 3.25
—Baltimore & Ohio .....
—Texas & Pacific .....
—Central of Georgia .....
—Pennsylvania .....
—Erie .....
—Westbrook Flat Cars 3.00
—Chicago & Northwestern .....
—Louisville & Nashville .....
—Baltimore & Ohio .....
—Pennsylvania .....

S GAGE

—Northeastern Single Sheathed Box 4.25
—Northeastern G. N. Caboose 6.75
—Northeastern Stock Car 4.25
—Nimco AF Atlantic Conversion 15.00
—Nimco AF Pacific Conversion 15.00
—Nimco AF Hudson Conversion 15.00
—Nimco AF Union Pacific Conversion 15.00
—Nimco AF Switcher Conversion 15.00
—Miller Diesel Switchar (less trks) 21.50
—S-10 Non Powered Truck 5.00

S GAGE

—S-11 Single Motor Truck 13.75
—S-12 Twin Motor Truck 22.50

OO GAGE

Scale Craft
—Caboose Kit 4.95
—Reefer Kit 4.95
—Box Car Kit 5.45
—Pullman Sleeper Kit 7.50
—Diner Car Kit 7.50
—Solarium Lounge Kit 7.50
—Coach Kit 6.85
—Baggage Kit 6.95
—Power Truck 19.50
—Freight Trucks, pair 1.75
—Passenger Trucks (4 wheel) 1.75
—Passenger Trucks (6 wheels) 2.75

HO GAGE

—Ideal Wrecking Crane 2.00
—Ideal Caboose 1.75
—JC Silver Side Coach 2.95
—JC Silver Side Pullman 2.95
—Megow Hopper 1.75
—Megow Caboose 1.75
—Megow Tank Car 1.75
—Megow Box Car 1.75
—Megow P.R.R. Coach 2.50
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—Kasiner Streamline Astradome 3.95
—Kasiner Streamline Observation 4.50
—Kasiner Streamline Baggage 3.25
—Kasiner Streamline Baggage Coach 3.75
—Kasiner Pullman Sleeper, Streamline ... 3.50
—Lehigh B & O Box Car 2.50
—Lehigh Reading Box Car 2.50
—Lehigh Pennsy Box Car 2.50
—Lehigh Seaboard Box Car 2.50
—Lehigh Lackawanna Box Car 2.50
—Lehigh New York Central Box Car 2.50
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—Manor Norfolk & Western Gondola 2.00
—Manor Seaboard Gondola 2.00
—Manor Wabash Gondola 2.00
—Manor Southern Gondola 2.00
—Manor Frisco Gondola 2.00
—Manor L & N Gondola 2.00
—Walther's Gas Electric 18.95
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—Walther's Pennsy MU Coach 18.50
—Walther's Pennsy MU Combine 18.50
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—Lindsey 6 wheel trailing truck 3.50
—Lindsey 4 wheel power truck 14.75
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—Hobby Town A&B Diesel casting set 6.95
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—Ulrich Hopper 3.15
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—Globe Southern Pacific Box Car 2.95
—Globe Burlington Box Car 2.95
—Globe Western Maryland Box Car 2.95
—Globe Baltimore & Ohio Box Car 2.95
—Globe New York, New Haven & Hartford.. 2.95
—Globe Nickle Plate Box Car 2.95
—Globe Canadian National Box Car 2.95
—Globe New York Central Box Car 2.95
—Silver Streak Green Bay & Western Reefer 2.60
—Silver Streak Box Car 2.85
—Silver Streak Reefers 2.60
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—Varney Economy Pacific 37.50
—Varney Deluxe Pacific 57.50
—Varney Deluxe Consolidation 57.50
—Varney Deluxe Mikado 58.50
—Varney Tenders for above 7.50
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—Mantua Mogul 29.50
—Mantua Belle of Eighties 29.50
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—Vista Dome 4.25

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—Sterling Flat Car 1.75

TT GAGE

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—2-8-0 Consolidation with tender kit 26.50
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—2-8-0 Built up less tender 20.00
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—High Side Furniture or Auto 1.50
—Caboose 2.00
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—50 Ft. Auto (steel sheath) 1.50
—50 Ft. Auto (wood sheath) 1.50
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—Gondola 1.50
—Hopper 1.50

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—Dremel Moto-Tool Shaping Table 2.50
—Dremel Moto-Tool #1 ..... 17.50
—Stand for #1 Tool 4.75
—Moto-Tool Sander 14.85
—Moto-Saw 8.85
—Speedway #89 ¼-inch drill 11.80
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—Speedway stand for above 12.95
—Speedway #117 Bench grinder 14.85
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—Burgess Sprayer 9.95
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—Casco Grinder 14.95
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—Burgess Vibro Tool 7.50

FROM COAST TO COAST MODEL BUILDERS LOOK TO CORR'S FOR THE FINEST MODELS, TOOLS AND SUPPLIES. IF YOU CAN'T VISIT CORR'S STORES, YOU CAN ORDER BY MAIL FROM CORR'S WITH COMPLETE CONFIDENCE.

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THE MODEL CRAFTSMAN

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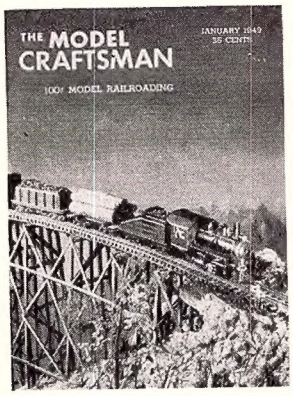

FRONT COVER

A Thomas 0-4-0 Switcher dragging a string of freight over the mountain division of George Zane's O gauge pike. George hails from Merchantville, N. J., and has been an enthusiastic O gauge modeller for the past twenty years. Photo by Gilbert Hinckle.

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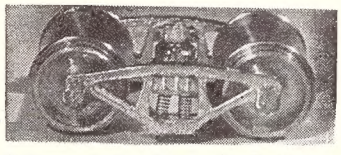

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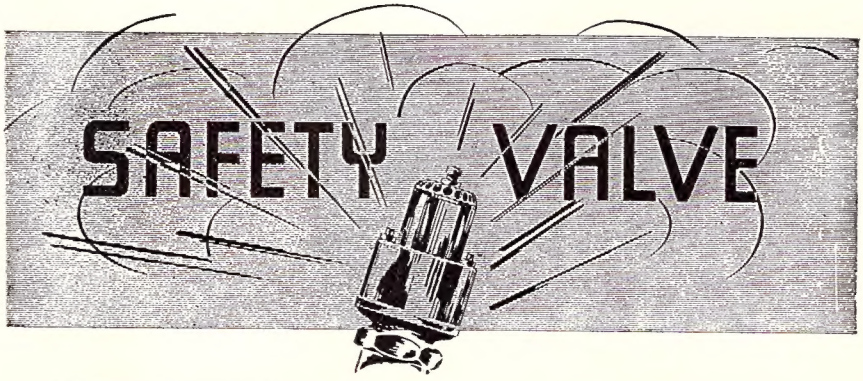

A CIRCUS BUILDERS VIEW

I read your valuable publication every month, I never miss an issue for fear I might miss the issue that some day may contain an article pertaining to Model Circus Trains and equipment. Should you ever publish such an article or Series, I am sure you will get some new subscribers from the hundreds of Circus Model Builders, Fans and Historical Societies. Each of these groups have large memberships.

I am sure that like myself there are many Circus Model Builders who read your very interesting magazine so imagine their surprise and reaction when on opening the R. R. Craftsman they should find an article on Circus Railroad models. I'm sure a front cover photo of a circus layout would catch the eye of many fellows who are building circus pikes. . . . George Greene, E. Liverpool, Ohio.

SEAMAN TURNS RAILROADER

Please send me a copy of the September 1943 issue particularly for the Shay geared Locomotive. I have been wanting to build one for a long time and last spring I saw a Shay in HO gauge in the town of Monroe, near here. It was one of the neatest little engines you could hope to see. The builder had used a 45 calibre slug for the steam dome and the piston rods worked from the drive rod. Of course the sight of that pepped me up and I had to have one for my own pike.

I built my layout from diagram No. 3, Interesting Terminal Operation, October 1947, and it turned out pretty good. Have no turntable or car barn as yet but they are planned for the future. My road is an independent branch line of the Great Northern with a small town terminal on the shores of Puget Sound and serving logging and mining areas in the Cascade Mountains so that terminal and a Shay locomotive fit right to a T.

I've been buying the magazine for the past three years and was very pleased when you went all railroads and gave the gas-engine boys a spot of their own. I like Barkley's articles and the "Layout Doctor" about the best. I get kidded quite a bit about being a model railroader because I've been a seaman all my working days. But, I also claim to be an exrailroader too because I was mate on the Milwaukee Roads' tug Milwaukee towing barges from Seattle to Port Townsend.

Please rush me that issue and the best of luck to you. . . . . Robert Vose. Edmonds, Wash.

AN ICEMAN'S HELPING HAND

I was just thumbing through the June 1944 and January 1945, issues of the Craftsman and would like to add my two cents worth to the articles by A Ronald Allen and C. A. James respectively. Mr. Allens' locomotive is modeled after the Canadian Pacific Rys 2800 series Hudson type. This looks like the real thing until you notice the valve gear. I don't believe the CP has an engine so equipped, but I may be wrong.

A little paragraph by Mr. James says: "I should like to see plans in M. C. for Canadian locomotives, as we have some dandys." Perhaps not all your readers are railroaders, incidentally, I am an ice-man but I find I have some pleasure in this field too, and so I'll relate some interesting facts for your readers.

The Canadian National and Canadian Pacific Rys. have good looking engines, but you never mentioned anything about the Pacific Great Eastern Ry. Mikado type engines. These engines are rather small, operating on 60 lb. rail until they reach the maximum gradients on which they operate on 70 lb. rail. The line has 2% grades and the engines are built with a maximum axle load of 42,000 lb. The entire locomotive and tender wheelbase is only 65 feet. The engine wheelbase is 15 feet. Cylinders are 20" diameter, stroke is 30" and drivers dia. is 57". A tractive effort of 17 tons is realized with 215 lb. boiler pressure. The emblem of the road appears on the tender—a caribou head encircled by the road's name.

For those of you who haven't seen pictures of CPR power, get the Sept. '47 issue of Railroad Magazine and look over the Hudson type engines. Some of these locos are unstreamlined, conventional Hudsons while others are the Royal Hudson's — streamlined with steam and sand domes missing and with big, speed suggestive running boards. Most people believe that the CP has only big locos (Western U. S. roads have Pacific type engines heavier than our Hudson's), but a class G-5 engine would

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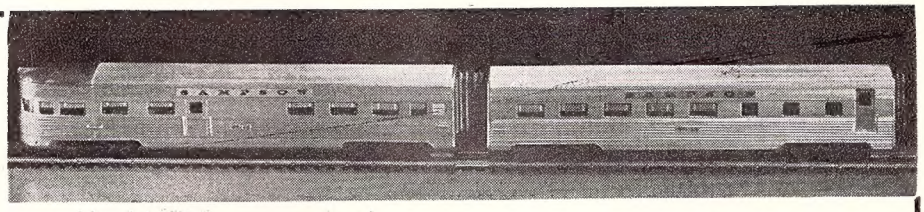

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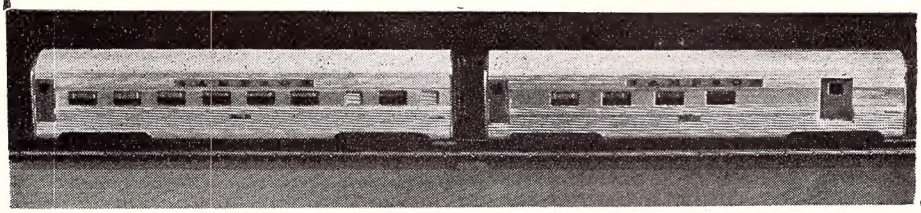

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make an ideal branch line loco for any modeller. Also the K-1-A class 4-8-4 Northern type engine would be a good item to model and my main purpose in writing this letter. If any of you boys, American or Canadian, would like to see plans of these engines, write to the Editor and speak your piece. . . . Ellwoode E. Moore, Ingersoll, Ontario.

THE FEUD IS ON

Anent the WATERBURY-PENN feud of the September and October issues, may I add my castigation to yours, and offer a cheer for your able defense of both the hobby and the manufacturers.

Any hobbyist with the slightest symptom of loyalty to his chosen field, would resent an article as destructive as Waterbury's. After reading the September issue of M. C. I was beginning to wonder if you really were 100% for model railroading. However, your "Hot Under the Collar" editorial reassured me and brought me to my feet cheering. As you no doubt have already suspicioned, I too am one of the fraternity, and, although I have never laid claim to being even as much as a "farm mechanic," I still have no difficulty in sticking together any of the standard kits. In fact my first attempt at locomotive building was Varney's Deluxe Pacific. Their instructions clearly stated that this model was for advanced hobbyists, but I tackled it without heavy tools, or anvil; and although I admit that it caused a little cussing, and called for wifely assistance in valve gear assembly, it still went together pretty slick and we had a Whale of a lot of fun in the doing.

Mantua's Belle of the Eighties was my second loco, and it practically fell together. As a matter of fact, it so sold me on Mantua that I've built everything they make except their new "Atlantic" and never have had a moment's trouble. I think we can all appreciate that unless a manufacturer is running a one man business mistakes can and do occur. But, I see no reason why a packing error should endanger the manufacturer's life.

For what this opinion is worth, it is offered in all sincerity. I believe that the manufacturers of model railroad kits are far and beyond their brothers, in the honesty of their advertising, and the quality of their products. My only complaint is that they periodically advertise an item before it is in the hands of their distributors (Probably an attempt to arrest the sales of competing items until their model appears). But even this practice, viewed from a business standpoint, can't be condemned too severely. Remember how the automobile firms advertised during the war, while you and I struggled to keep our road-weary buggies going, drooling constantly at their pretty pictures! If I may make a recommendation to Mr. Waterbury, I would suggest that he henceforth confine himself to the purchase of fully assembled kits and thus avoid apoplexy. . . . R. A. Service, Port Jervis, N. Y.

We haven't met, but with the Pittsburghers who do know you and reading Craftsman for several years, you are not a stranger to my husband and me. Contrary to the usual practice, I am as avid a model railroader as my husband. I have turned out some creditable models and feel that I have a right to make the following comments.

Why all the apologies for "The Confessions of a Model Rail?" Surely Mantua can take a little ribbing without getting hot under the collar. The above said "Model Rail" is not the only person who has had difficulties. If any manufacturer could turn out a kit that would please one and all and fit the skill of every modeller, he would indeed be "omnipotent" and the rest of the Model Manufacturers would "fold up their tents" and like the Arabs, as "silently steal away." We have in our family "one intelligent adult" who was stymied by a Mantua kit. That's no reason for Mantua to explode or for you either. It is merely a fact. I (a mere woman in the opinion of many model railroaders) have assembled a Mantua Mogul. I enjoyed doing it (and I told Mantua so) but I didn't do it in an evening. I too had difficulties with the rivets. Also I used a soldering iron, the cab is much neater looking with a soldered seam instead of the clips that are furnished. Do any two people have the same degree of skill and coordination? What one person can do with ease will be a

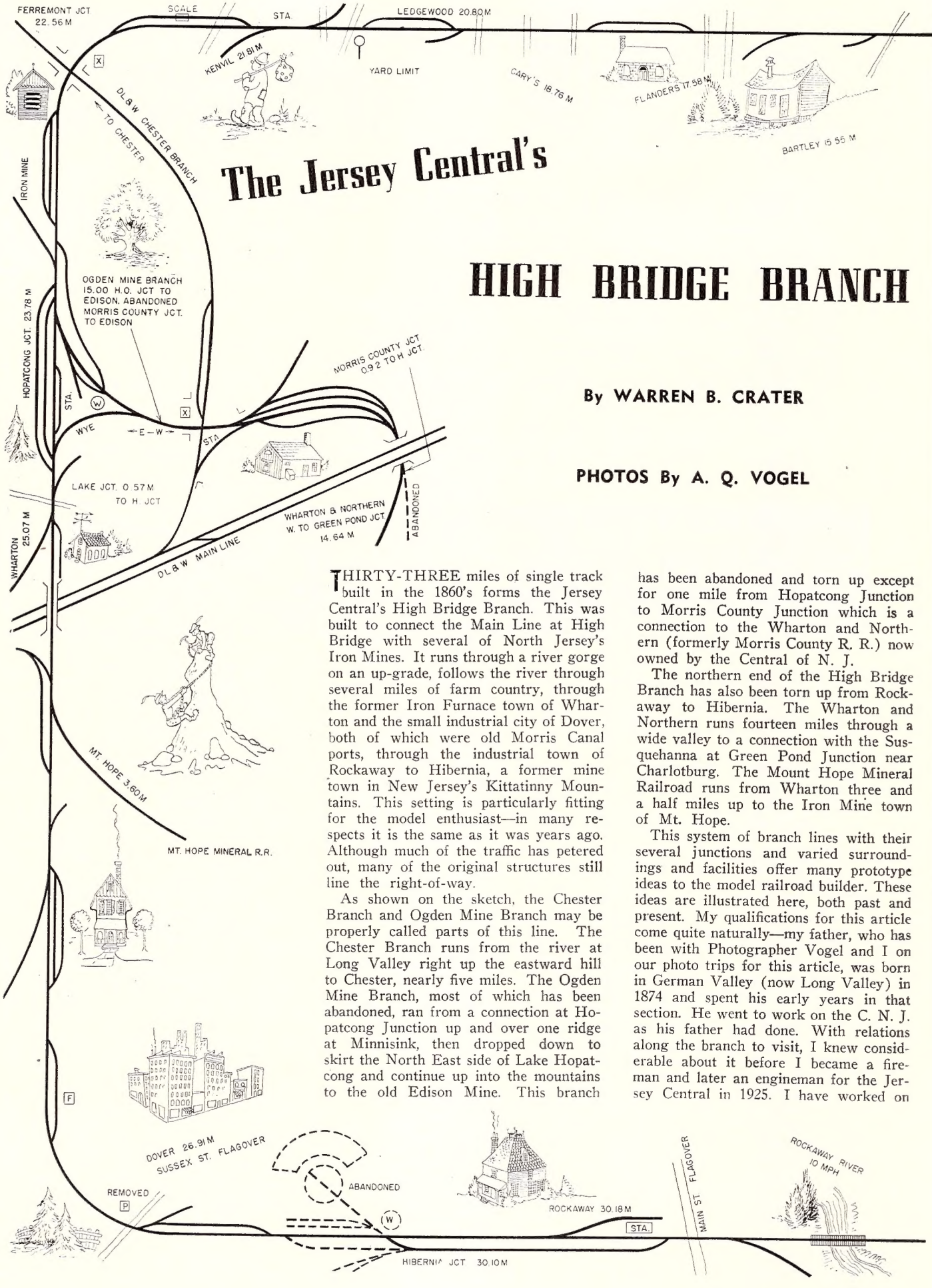
(Continued on page 43)

The Jersey Central's

HIGH BRIDGE BRANCH

By WARREN B. CRATER

PHOTOS By A. Q. VOGEL



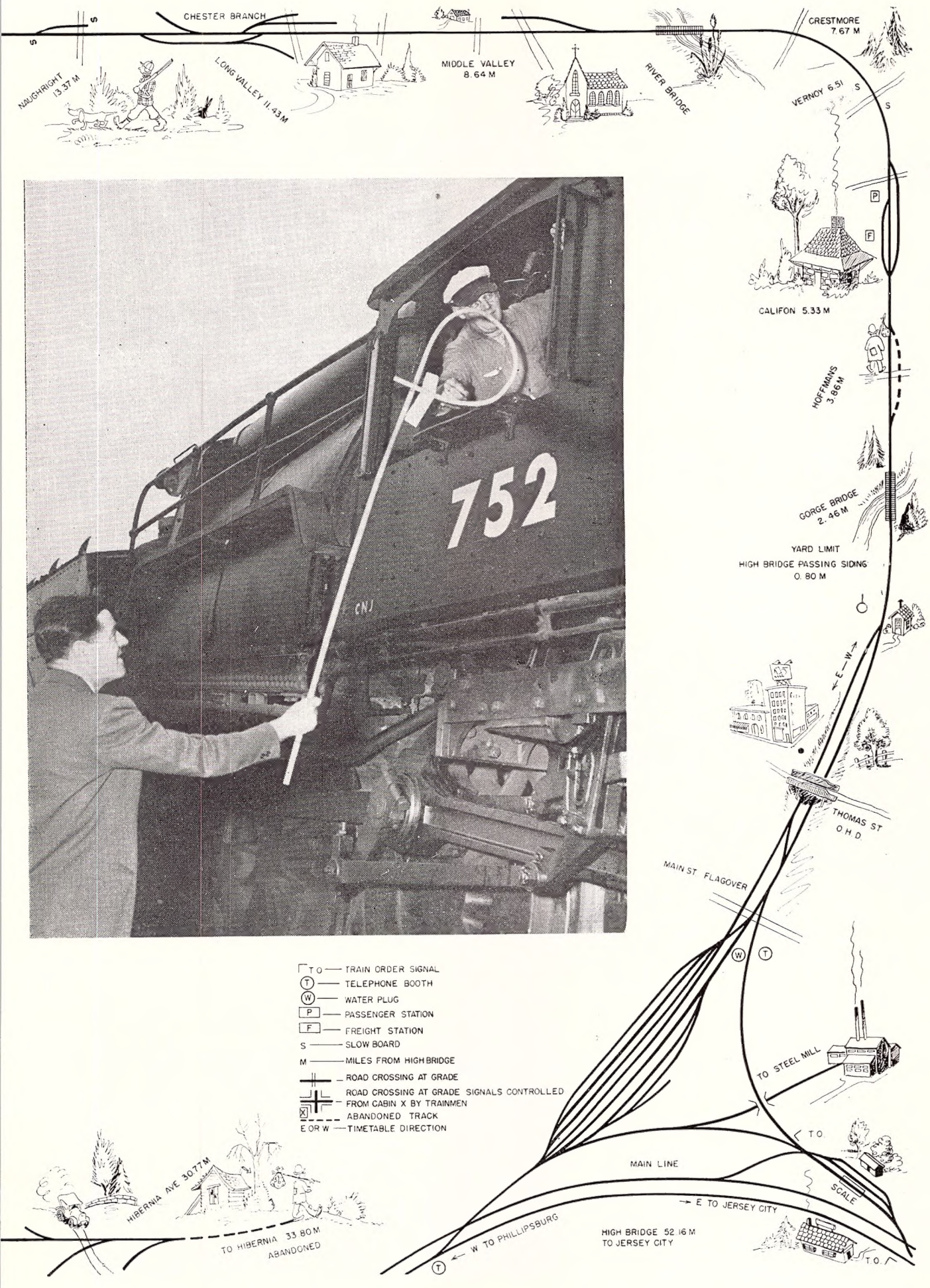
THIRTY-THREE miles of single track built in the 1860's forms the Jersey Central's High Bridge Branch. This was built to connect the Main Line at High Bridge with several of North Jersey's Iron Mines. It runs through a river gorge on an up-grade, follows the river through several miles of farm country, through the former Iron Furnace town of Wharton and the small industrial city of Dover, both of which were old Morris Canal ports, through the industrial town of Rockaway to Hibernia, a former mine town in New Jersey's Kittatinny Mountains. This setting is particularly fitting for the model enthusiast—in many respects it is the same as it was years ago. Although much of the traffic has petered out, many of the original structures still line the right-of-way.

As shown on the sketch, the Chester Branch and Ogden Mine Branch may be properly called parts of this line. The Chester Branch runs from the river at Long Valley right up the eastward hill to Chester, nearly five miles. The Ogden Mine Branch, most of which has been abandoned, ran from a connection at Hopatcong Junction up and over one ridge at Minnisink, then dropped down to skirt the North East side of Lake Hopatcong and continue up into the mountains to the old Edison Mine. This branch has been abandoned and torn up except for one mile from Hopatcong Junction to Morris County Junction which is a connection to the Wharton and Northern (formerly Morris County R. R.) now owned by the Central of N. J.

The northern end of the High Bridge Branch has also been torn up from Rockaway to Hibernia. The Wharton and Northern runs fourteen miles through a wide valley to a connection with the Susquehanna at Green Pond Junction near Charlotburg. The Mount Hope Mineral Railroad runs from Wharton three and a half miles up to the Iron Mine town of Mt. Hope.

This system of branch lines with their several junctions and varied surroundings and facilities offer many prototype ideas to the model railroad builder. These ideas are illustrated here, both past and present. My qualifications for this article come quite naturally—my father, who has been with Photographer Vogel and I on our photo trips for this article, was born in German Valley (now Long Valley) in 1874 and spent his early years in that section. He went to work on the C. N. J. as his father had done. With relations along the branch to visit, I knew considerable about it before I became a fireman and later an engineman for the Jersey Central in 1925. I have worked on

752
CNJ


CHESTER BRANCH
NAUGHRIGHT 13.37 M
LONG VALLEY 11.43 M
MIDDLE VALLEY 8.64 M
RIVER BRIDGE
CRESTMORE 7.67 M
VERNOY 6.51
CALIFON 5.33 M
HOFFMANS 3.86 M
GORGE BRIDGE 2.46 M
YARD LIMIT
HIGH BRIDGE PASSING SIDING 0.80 M
E — W
THOMAS ST O.H.D.
MAIN ST. FLAGOVER
TO STEEL MILL
TO
MAIN LINE
SCALE
E TO JERSEY CITY
W TO PHILLIPSBURG
HIGH BRIDGE 52.16 M TO JERSEY CITY
TO
HIBERNIA AVE 30.77 M
TO HIBERNIA 33.80 M ABANDONED
TO — TRAIN ORDER SIGNAL
T — TELEPHONE BOOTH
W — WATER PLUG
P — PASSENGER STATION
F — FREIGHT STATION
S — SLOW BOARD
M — MILES FROM HIGH BRIDGE
ROAD CROSSING AT GRADE
ROAD CROSSING AT GRADE SIGNALS CONTROLLED FROM CABIN X BY TRAINMEN
ABANDONED TRACK
E OR W — TIMETABLE DIRECTION

The station at Long Valley (formerly German Valley). This is typical of stations on the branch. Note the overgrown track in the foreground.

Califon station, the only stone building on the branch. Local legend claims the name was shortened from California many years ago.

the branch enough to be quite familiar with its physical aspects and its operation.

Even with the modern Diesels grunting the "Ore Train" tonnage up stiff grades and around tortuous curves, there are many of the quaint 19th Century settings left, much as they were originally built. In former years, passenger, milk and freight trains had schedules. Passenger trains were first class, milk and mixed were second class and freight were third class. Today there is only freight service and every train or engine movement is made on train orders.

In addition to the Iron Ore and Milk there was a large movement of natural ice from Lake Hopatcong to the cities and towns which used it. In the winter, the ice was cut and shipped to the city icehouses until they were filled. In addition to the large commercial storage houses, the railroad had private facilities at each of the main and local passenger car yards. When these were filled, the large icehouses on the lake shore were filled to capacity from which shipments were made all summer. Manufactured ice finally eliminated this business in 1927.

Many parts of the branch were abandoned when the iron mines petered out. The centralizing of industry during the 1930's caused the abandonment of all the furnaces and rolling mills in Wharton, Dover and Rockaway. The nearest of this type of industry to the branch now is the steel mill at High Bridge.

During the summer months, on Sundays and holidays, excursion trains ran to Lake Hopatcong. The railroad developed the upper end of the lake and provided a picnic grove on the shore, near Lake Hopatcong Station. Early in the twenties, the auto took a large slice of this business. An attempt was made to revive it in the early thirties, but it didn't take and was soon discontinued forever (the track has since been torn up).

In spite of all these changes, the branch seems to hold more than its share of fan attraction. Rail fan trips are operated in addition to scenic and camera trips in spite of the fact that the "Ore Train" is the only regular movement on Sundays and the two road drill engines at Hopatcong Junction are the only power stored anywhere along the branch.

While the ore train still hauls ore, it also carries many other commodities which were formerly handled by the local freight, numbers 933 and 934.

A vast powder works at Lake Junction and two arsenals on the Wharton and Northern will keep the road in profitable operation regardless of the fluctuation in other traffic.

The passing sidings have nearly all been removed due to declining traffic. Some of these were very short and were used by the milk train to clear for the passenger trains.

Stations, most of which are still in service, are small and of frame construction. These stations are typical of the older roads throughout the states and should be very interesting to model. The stone building at Califon is a notable exception, it is now used as operators' and freight agents' offices. The station at Hopatcong Junction houses the engine terminal office and storage. None are provided with train order signals—instead the operator puts a red flag in the main track. All stations are closed at night.

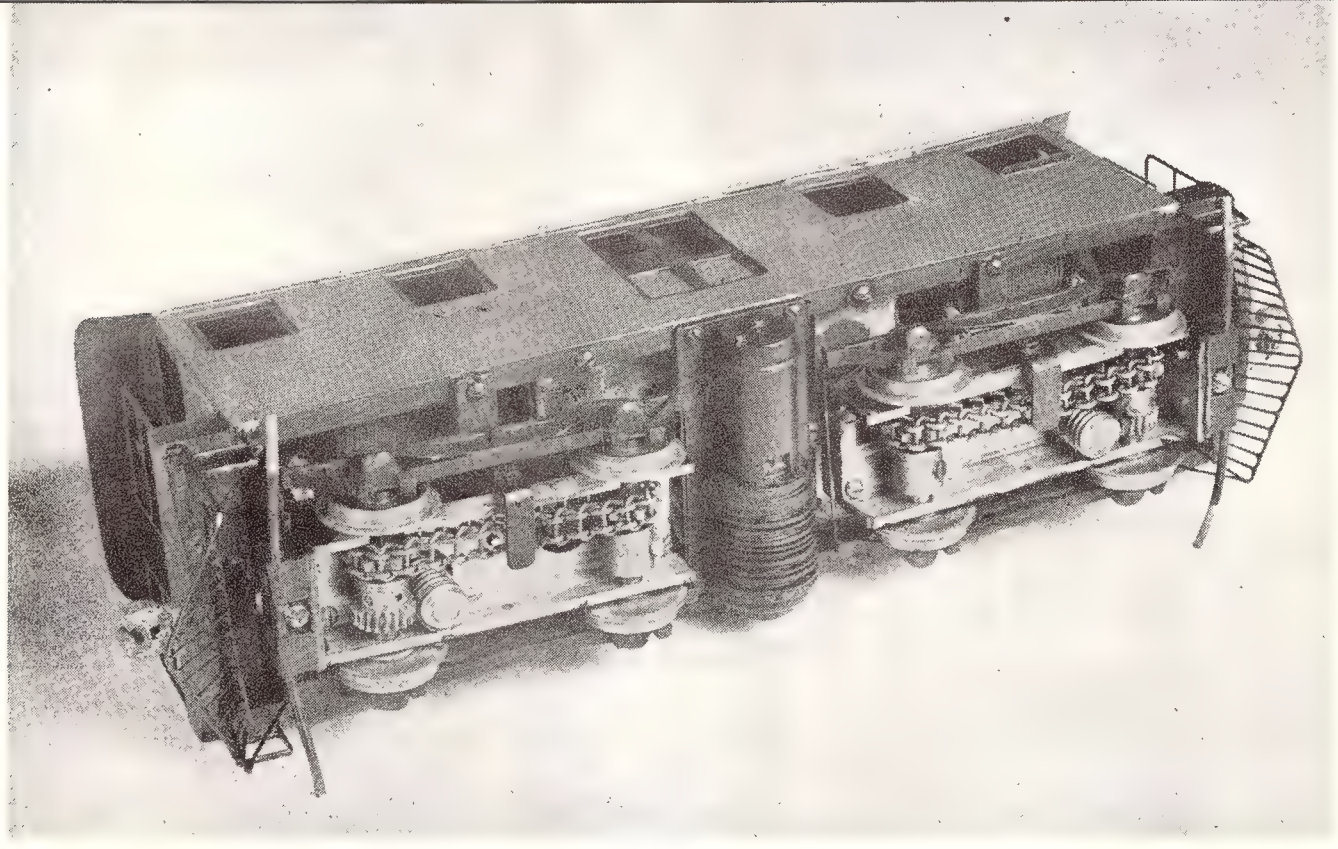
Hopatcong Junction—known as HO by the men of the Jersey Central. This old station is an engine terminal office. Engine is on terminal track.

Bratley station from rear resembles an old wooden box car with weak truss rods.

There was a small roundhouse with an Armstrong turn-table at Hibernia Junction (now is Rockaway). The water tank was supplied from the adjacent Rockaway River by a steam driven pump. This is really the end of the High Bridge Branch and the Hibernia Mine Railroad, which became a part of the Jersey Central at about the turn of the century, extended from this point.

Hand switch stands with their lights and disks and the slow boards compose the greatest number of fixed signals on the branch. However, at Lake Junction and Ferremont Junction, crossings of the D. L. & W. R. R. Chester Branch, there are one arm manually operated semaphores, one for each direction on each railroad. When both roads ran passenger trains all of these signals were normally in stop position. To make a movement over the crossings, a member of the crew had to enter the cabin (about the size of a crossing watchman's shelter and protected by a switch lock), pull lever number one forward, which locked the door and unlocked the four signal levers. Then he would pull the signal lever to clear the signal for his train. This would lock the door lever and the

(*Continued on page 45*)



Staff Photo

Electric Trolley Locomotive

By LONG VALLEY ELECTRIC RAILWAY **PART III**

WITH the exception of the headlights, all the accessory items for this electric trolley locomotive are detailed on the accompanying drawing. Perhaps the most important accessory is the lead ballast block, without which the locomotive would be hardly worth its keep on a layout.

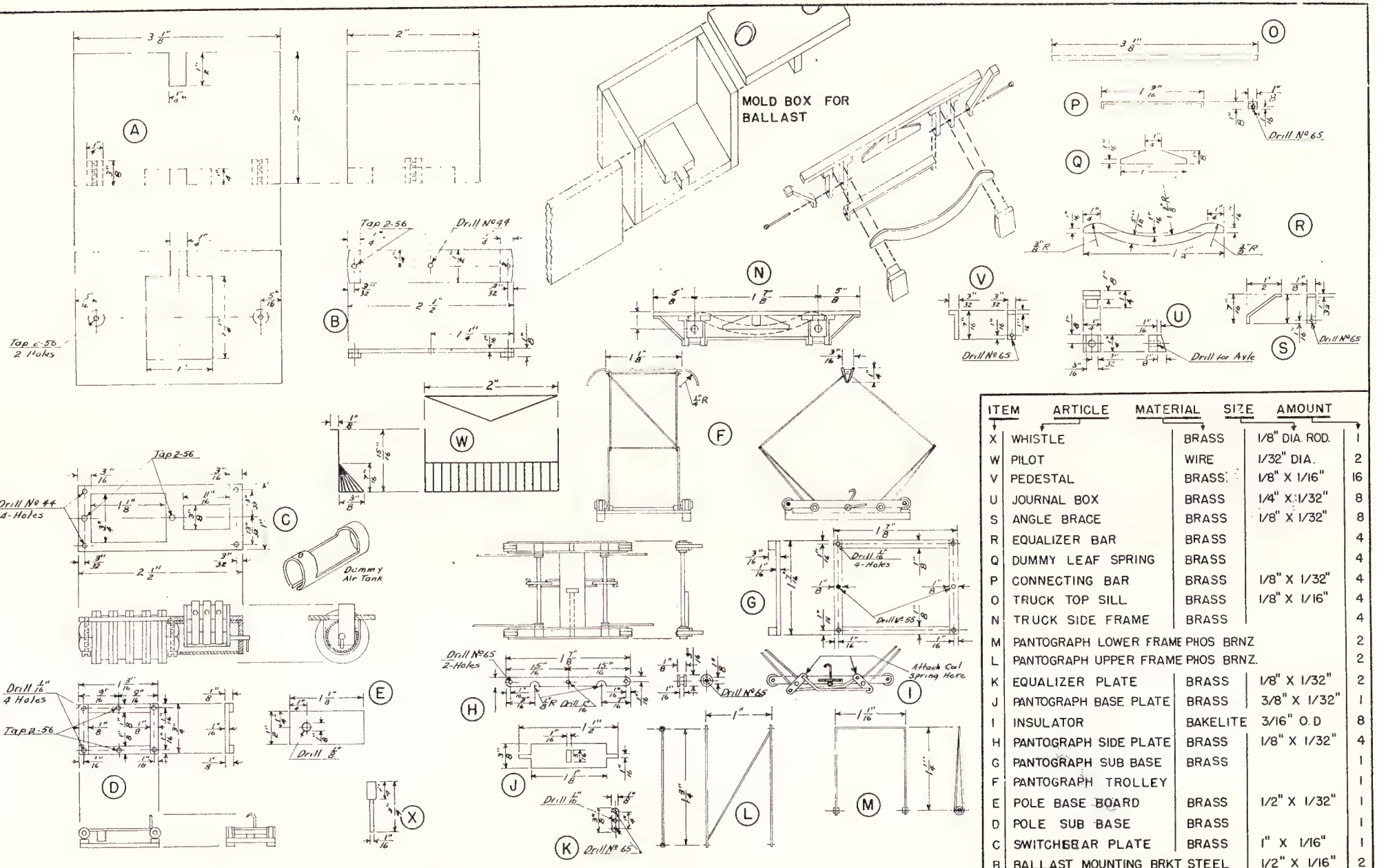
Item A shows the finished dimensions of this 4½ lb. block. Cutouts are necessary in the top and bottom sides to clear obstructions in the cab, but since lead neither cuts or drills easily, the block is best formed by molding. A simple mold for this purpose is sketched that can be nailed together from scrap bits of wood. Note that the required cutouts become blocks that are nailed to the top and bottom elements of the mold. Two ½" dia. holes are then drilled in the top piece, one adjacent to each end to act as pouring spout and riser, then the mold can be nailed up like a box. Since the mold may leak around the seams when being poured, it is good practice to bury it in a box of sand or ashes with only the top cover exposed. Pour the lead in one hole steadily until it overflows out of the other hole, thus insuring freedom from blow holes. The mold must, of course, be destroyed when removing the casting, the cutout blocks may have to be chipped out of the casting the hard way.

When the lead has cooled, drill two ¼" holes in the bottom surface as specified, then solder in brass plugs that have been tapped to receive 2-56 screws. The ballast block is supported within the cab by two mounting bars, fashioned from 1/16" thick steel as detailed in Item B. 1/16" pads are soldered to the ends of the bars so that the block will be raised ⅛" above the frame sills in order to provide clearance for the motor cables. Note in the photograph that these bars have curved ends and swivel at their midpoints to permit insertion between the frame sills.

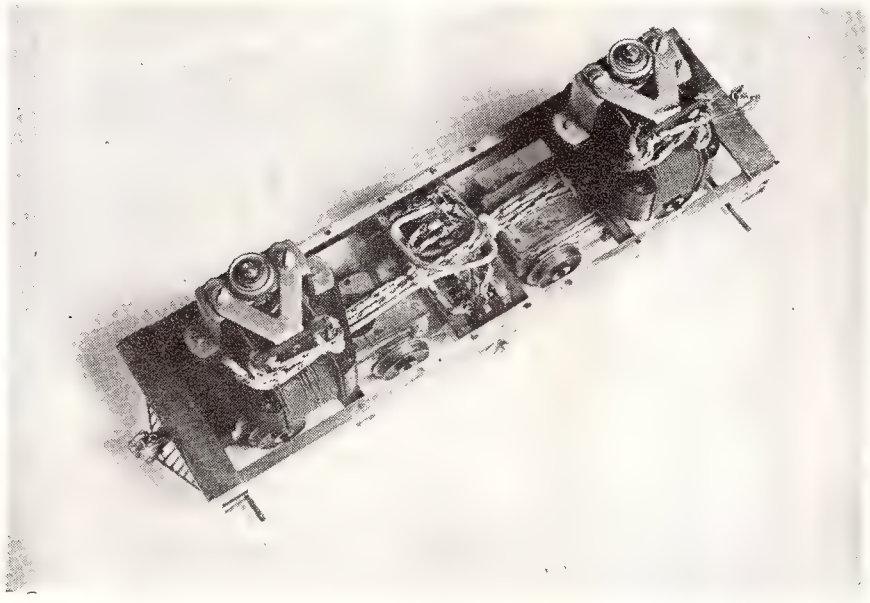
An ordinary manual drum reverser is the only necessary control item. However, the model shown operates on DC, thus carries a rectifier in circuit with the hand reverser to permit polarized reverse control. The switchgear plate, detailed in Item C, has room for both the hand reverser and the large size ¾" diameter Mallory rectifier, thus one or both items may be installed as desired.

Practically all the control apparatus on the prototype engines is housed in the cab so that a large diameter air tank is the only prominent underbody control unit visible. On our model, this air tank becomes a shroud to conceal the hand reverser. Incidentally, the reverser used is a very compact drum switch purchased from the Cleveland Model Supply (CD Line) and together with the rectifier just fits within the frame sills. A cross sectional view will show the method of attachment used for the control items. By means of 2-56 screws, passing through holes drilled in the clamping nuts, the rectifier is fastened under the switchgear plate with the connection lugs projecting up through the cutout in the plate. The drum switch is suspended through a cutout so that its operating shaft is ½" below the plate and centrally located. Solder the reverser fast in this position to the switchgear plate.

A dummy air tank is fashioned from ½" OD thin walled tubing as shown in the sketch. On the outward end of this tank, solder a head that is to be drilled for the reverser shaft to pass through. Cut away the center portion of the tube to accommodate the reverser body, then drill and slot the inward end as shown. When in position, the inner end of the tube neatly slips over the rectifier bold head so that one screw supports the inner ends of both control items. You will see this construction in the bottom chassis photo. A slot in the bottom side of the tube forms a passageway for the screw head, while the hole in the upper side obviously receives the holding screw before it enters the plate. Open up a 1/16" dia. cotter pin, wrap it around the outer end of the air tank, solder ends fast to plate and thus simulate the hoops used to suspend tanks in real practice. With the air tank in place, cut off the excess reverse shaft and solder on a short length of wire to act as an operating lever. This



ITEM	ARTICLE	MATERIAL	SIZE	AMOUNT
X	WHISTLE	BRASS	1/8" DIA. ROD.	1
W	PILOT	WIRE	1/32" DIA.	2
V	PEDESTAL	BRASS	1/8" X 1/16"	16
U	JOURNAL BOX	BRASS	1/4" X 1/32"	8
S	ANGLE BRACE	BRASS	1/8" X 1/32"	8
R	EQUALIZER BAR	BRASS		4
Q	DUMMY LEAF SPRING	BRASS		4
P	CONNECTING BAR	BRASS	1/8" X 1/32"	4
O	TRUCK TOP SILL	BRASS	1/8" X 1/16"	4
N	TRUCK SIDE FRAME	BRASS		4
M	PANTOGRAPH LOWER FRAME	PHOS BRNZ		2
L	PANTOGRAPH UPPER FRAME	PHOS BRNZ.		2
K	EQUALIZER PLATE	BRASS	1/8" X 1/32"	2
J	PANTOGRAPH BASE PLATE	BRASS	3/8" X 1/32"	1
I	INSULATOR	BAKELITE	3/16" O.D	8
H	PANTOGRAPH SIDE PLATE	BRASS	1/8" X 1/32"	4
G	PANTOGRAPH SUB BASE	BRASS		1
F	PANTOGRAPH TROLLEY			1
E	POLE BASE BOARD	BRASS	1/2" X 1/32"	1
D	POLE SUB BASE	BRASS		1
C	SWITCHGEAR PLATE	BRASS	1" X 1/16"	1
B	BALLAST MOUNTING BRKT	STEEL	1/2" X 1/16"	2
A	BALLAST BLOCK	LEAD	4 1/2 LBS.	1



Staff Photo

lever somewhat resembles the piping found on such air tanks.

Although any standard type of trolley pole base can be used, our model should properly have a U S-11 style, characterized by a single compression spring. You will find a method for building this type of pole base described in the July '48 issue of MODEL CRAFTSMAN.

The base board assembly, Item D, follows the prototype design in that the board is supported on four tubular insulators which in turn are strapped to a wooden sub base that is bolted to the roof. The "Lumber" in our sub base is rare old long leaf brass having no appreciable insulation value, so our insulators must provide both mechanical support and electrical separation. Make the sub base by cutting four strips of ⅛" x 1/16" brass to length, soldering them into the rectangular shape specified. Four 1/16" dia. holes are to be drilled at the corners.

The insulators used on this assembly are the same as those specified in Item I for the pantograph except that 1/16" dia. lengthwise holes will be required. Bakelite, lucite or similar insulating material can be used. Those shown on the model were cut down and grooved from ¼" bakelite rod, using a drill press for a lathe and files as cutting tools. Each insulator is held to the sub base by means of a cotter pin, 1/16" dia., wrapped around in the groove with its shank pressed down into the base corner holes where they are soldered fast. The heads on 1/16" cotter pins have loops that are approximately ⅛" dia. rod and squeezing it to exact size before snapping it in place on the insulator. When the insulators are in place, insert 1/16" rods through the end pairs as supports for the base plate.

Item E shows dimensions for the base plate to be cut from 1/32" brass sheet. Solder a 3/16" length of ⅛" dia. brass rod into the hole provided, with the upper end flush with the base plate. Finally, drill a No. 44 hole down the center of the rod to create a trolley pole socket that agrees with NMRA standards. Now place the base board on the rods between the insulators and solder it fast. Form the hold down hook from 1/32" wire, then solder it on the baseboard so that the trolley pole will be horizontal and pointed along the roof center line when hooked down. The completed base assembly is located along the roof center line at a distance of 3¼" in from the end. Use the tapped holes in the base to spot the corresponding holes required in the roof. A pair of 2-56 screws pass up through the roof from inside the cab to hold the base in place.

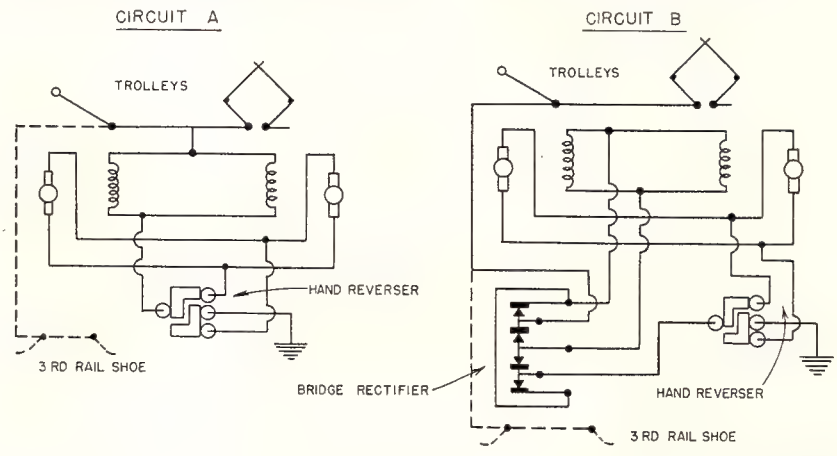
One noticeable characteristic of early Baldwin-Westinghouse AC locomotives was the peculiar construction of the pantographs with cross rods at the elbows and single diagonal braces in the top frames. Our model pantograph makes use of these features and incorporates a base that permits easy removal of the trolley since it will sooner or later become snagged in the overhead even on the best layouts. To this end, the base proper and the sub base, shown in Item F, form a rigid assembly held to the roof by two 0-80 screws that are removable from the top side.

The sub base, Item G, is similar in plan to the pole sub base previously described except that the lengthwise "planks" are cut from ⅛" square stock. Note the two holes in the end pieces for the 0-80 mounting screws. When the sub base is completed, use it as a guide to locate the tapped mounting holes in the roof. The center of the pantograph is located 2⅞" back from the roof edge. Four insulators are needed per Item I.

Item H specifies the side frames to be shaped from 1/32" brass sheet. There is an easy way to form the two ⅛" radius cutouts along the lower edge. This is to layout the side frame on a wider strip so that ⅛" holes can be drilled. Then snip away the lower half leaving the desired semi-circular cutouts. At this point, assemble the side frames in pairs using No. 20 wire brads as rivets to hold the insulators in place between the frame pairs. The nail heads should be on the outside while the ends are clipped off and soldered to the inner frames, then filed flush with the surface. The base plate, described in Item J, is used to hold the side frame pairs in rigid alignment, but also serves to support the hook rigging. Cut this plate from 1/32" brass sheet and dress the end projections with a file until they will fit snugly within the 1/16" dia. holes at the centers of the side frames. Now assemble the frames on the base plate, level the assembly on a smooth surface and solder the three parts together at all exposed surfaces. Those ⅛" cutouts mentioned above are seats into which the shaft bearings will be soldered. Each bearing is a 3/16" length of tubing, ⅛" OD and 1/16" ID. Use a length of 1/16" rod as a mandrel to hold the bearings in alignment when soldering them in place. Join the base to the sub base with cotter pins wrapped around the insulator grooves and set in the corner holes as was done when making the trolley base unit.

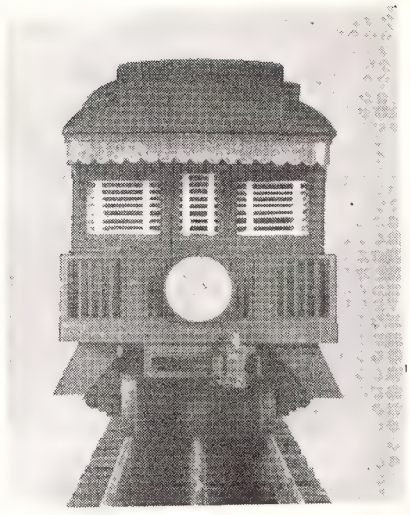
Two shafts are required, and these can be brass or steel rod of 1/16" dia. or even finishing nails. Item K details the equalizer cranks, two of which are required. By all means drill these two pieces simultaneously, otherwise the pantograph will rise in a lopsided manner. Top and lower frames are set forth in Items L & M. These are bent from 1/32" dia. brass or phosphor bronze wire. You will find brass wire easy to work, but phosphor bronze is much more resistant to damage by snagging. Each piece is formed from a continuous length of wire.

(*Continued on page 39*)



FOUR COMPARTMENT

Pullman Observation Car



PART II

By LEWIS AUSTIN

Two Pages of Plans Follow

THE body of the four compartment Pullman Observation car is built-up in the conventional way with a wood roof and floor and sides of bristol board. This is about the simplest way to construct a model passenger car and it insures the car being light enough so that your locomotives have no trouble hauling it over your pike.

Construction can be started by making the roof. Purchase the milled roof section in a hobby store and look it over carefully to be certain that it is not warped or too grainy. Be sure that the roof section has the beading along the edges of the clerestory. The length of the roof can be taken from the drawing showing the side views of the assembled car. These drawings are to a scale of ⅛" to the foot for obviously the drawings could not be made full size and still fit the page. Just double the length shown on the drawing to get the correct roof length for O gauge.

Cut the roof to length and saw and file away the strips on the underside of the roof on the end that will cover the observation platform. Cut the strips back as far as is shown on the full-size drawing of the car end. The strips are also cut away on the other end of the roof but only back the thickness of the wood end. This end of the roof will also have to be cut out to fit the curved top edge of the car end. This can be seen on the full-size drawing of the front end of the car. The end of the car body is made easily out of white pine. Cement a piece of 3/16" wood behind the end to form the steps to which the ends of the sides will be cemented.

The floor is simply a piece of ¼" thick white pine. The width should be the same as the width of the strips on the underside of the milled roof section that you are using. Cut the floor to length and cement the wood car end in place. Two brads can be hammered through the floor and into the car end to make it more secure. Do not trim the end of the floor to match the angles on the car end yet. File the step in the end of the floor as shown and also make the saw slot in the underside of the roof with a fine hacksaw.

Make four spacer strips out of ½" by ⅜" white pine and nail and cement them in place on the car floor. The locations of these spacers are shown by the dotted lines on the drawings of the assembled car body. The length of the spacers should be the same as the distance between the roof and floor. The roof section can now be nailed and cemented to the car end. The brads can be hammered through the car end and into the strips on the underside of the roof. The roof is also cemented to the tops of the spacers. Brads can be driven down through the roof and into the spacers. The heads of the brads will not show on the roof, for they will be covered by the air-conditioning strip.

The brass end for the observation end of the car is made next. The end is made out of two pieces shaped as shown on the full-size templates on the drawing. Use 1/64" sheet brass. Cut out the window and door openings and bend the edges over on the dotted lines. One piece should fit in back of the other to form the door and window sash. Solder the pieces together and put them aside for the present.

The platforms are sawed and filed to shape out of ⅛" thick brass. Drill and countersink the holes as shown on the drawing. Do not drill and tap the 2-56 holes yet. The steps are built up out of 1/32" sheet brass. Make the side pieces first, then bend a strip of brass to form the steps. Clamp the sides in place on the steps with a parallel clamp and solder the steps together. The traps are cut out of 1/32" sheet brass. Solder the traps in place on the platforms. The top of the traps should be flush with the top surface of the platform. After the traps are in place, solder on the steps.

The brass end can now be soldered to the observation platform. Make the platform railing out of 1/64" sheet brass. The full-size templates are shown on the drawing. After the sheet brass parts are cut out, bend them on the dotted lines. The rods on the railings are simply lengths of #70 brass wire soldered in place in back of the sheet brass parts. The two posts are made out of ⅛" square brass and soldered in place in the slots in the observation platform. The caps on top of the posts are filed out of brass and soldered in place. File the hand brake lever out of brass and mount it on a 1/32" brass rod shaft. Solder the shaft in a hole drilled in the platform. The platform railings can now be soldered in place.

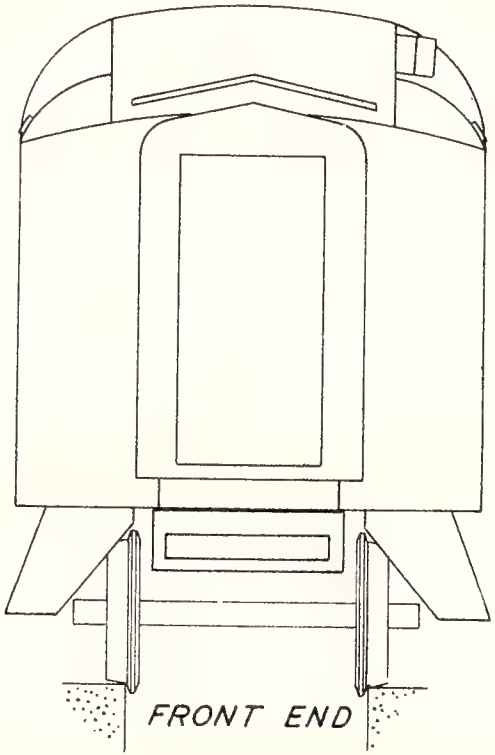
The name plate on the platform was made out of 5/8" diameter brass tubing with a brass disc soldered in the back end. Solder the name plate in place being careful not to loosen any of the rods on the platform railing. The lettering was scratched deeply on a piece of 1/16" thick celluloid cut to fit inside the brass tubing. Cut a disc out of bristol board and cement it inside the tubing, then press the celluloid disc in place. The celluloid is then painted black. After the paint has dried, rub the name plate with fine emery cloth. This will remove the paint from the surface of the celluloid but leave the paint in the lettering that was scratched into the celluloid. The bristol board disc gives the name plate a white background and helps to make the celluloid look like frosted glass. The front platform and the observation platform can now be screwed to the car floor with flat head wood screws. Note that the top edge of the brass end slips into the saw slot made in the underside of the roof. The front end of the floor can now be shaped to match the angles of the wood end and brass platform.

The coupler pockets are built up out of two pieces as the drawing shows. File the pieces to shape and solder them together. Drill the 3/32" holes in the coupler pockets and drill and tap the 2-56 holes in the platforms. The coupler pockets can then be fastened to the platforms with 2-56 screws. A 2-56 hole is also drilled and tapped in each coupler pocket for mounting the couplers.

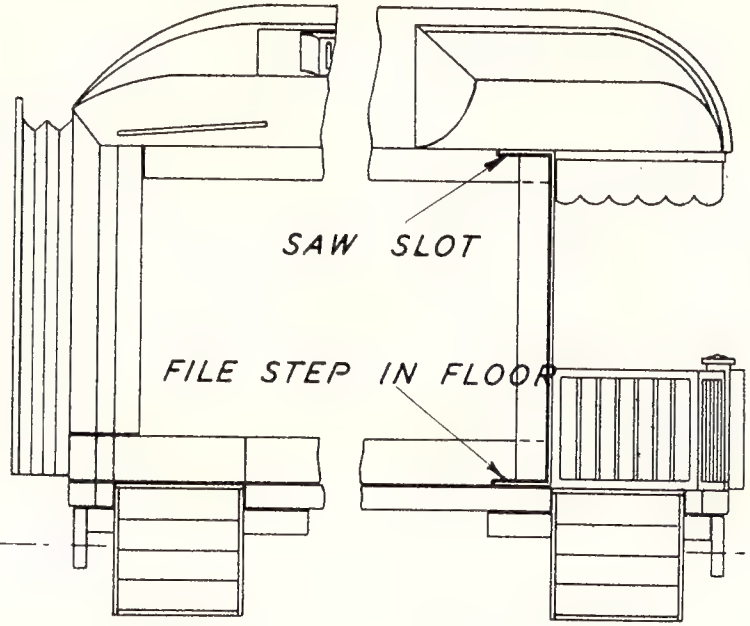
The ends of the roof can now be rounded off and finished. Make templates from the full-size drawings of the car ends and use them while shaping the roof. Note that the ends are not alike. The beading on the roof can be carried right down by cutting pieces of wood to

(Continued on page 49)

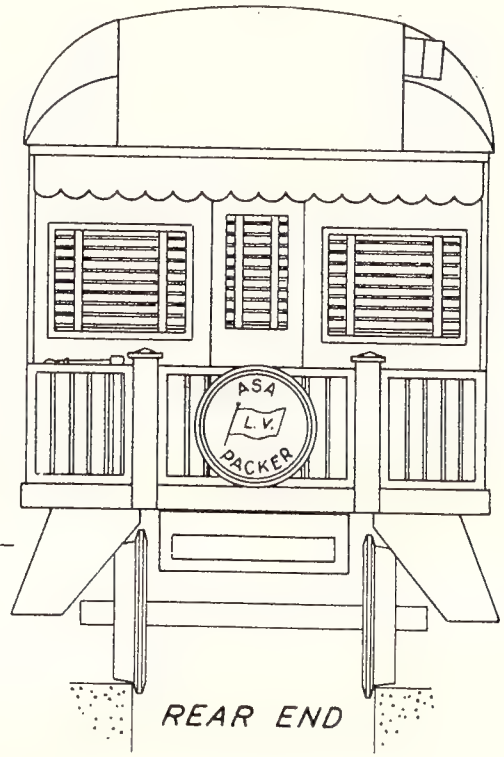
FOUR COMPARTMENT PULLMAN OBSERVATION CAR



FRONT END

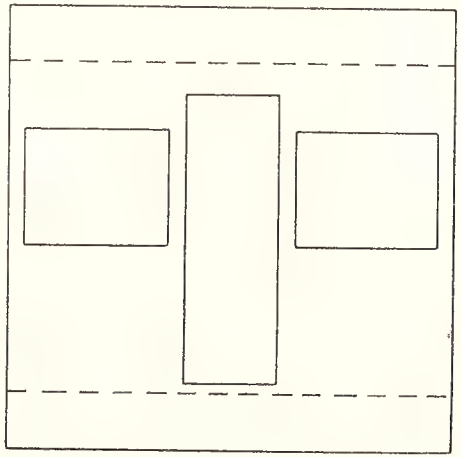


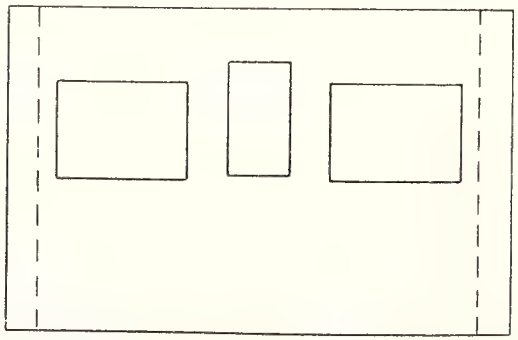
DETAILS OF CAR ENDS



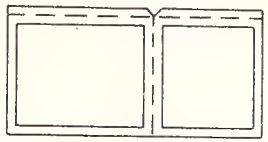
REAR END

DRAWINGS ARE
FULL SIZE FOR O-GAUGE

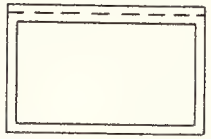




TEMPLATES FOR CAR END

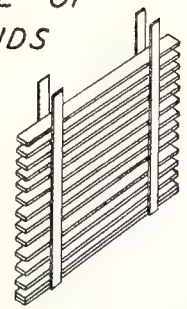


MAKE ONE LEFT
AND ONE RIGHT



PLATFORM RAILINGS

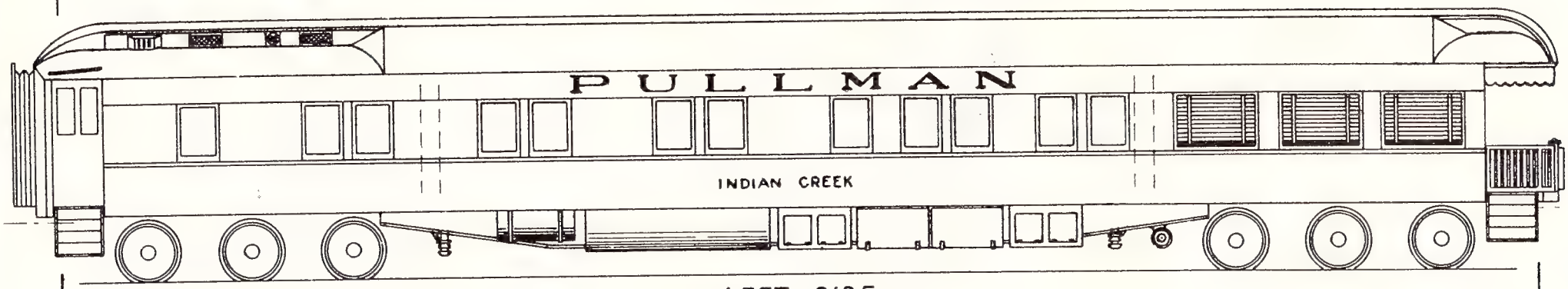
DETAIL OF BLINDS



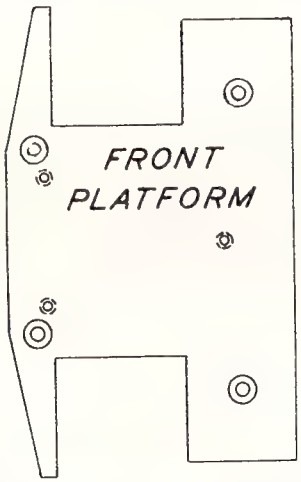
NOT TO SCALE

L. AUSTIN

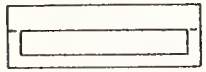
FOUR COMPARTMENT PULLMAN OBSERVATION CAR

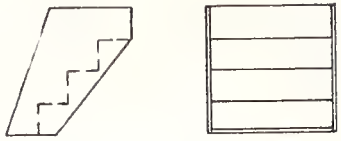


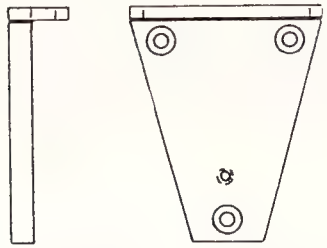
LEFT SIDE

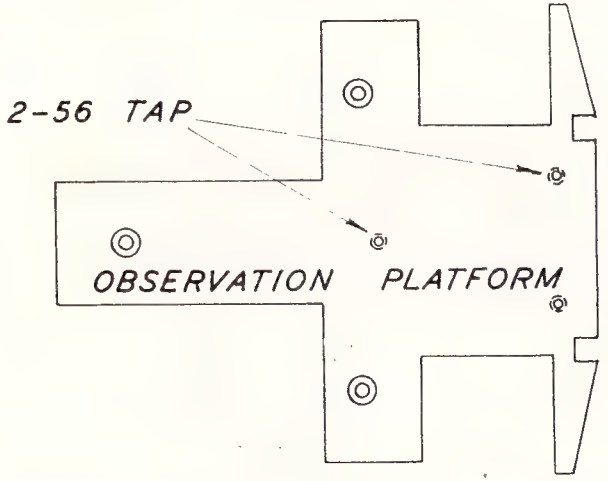


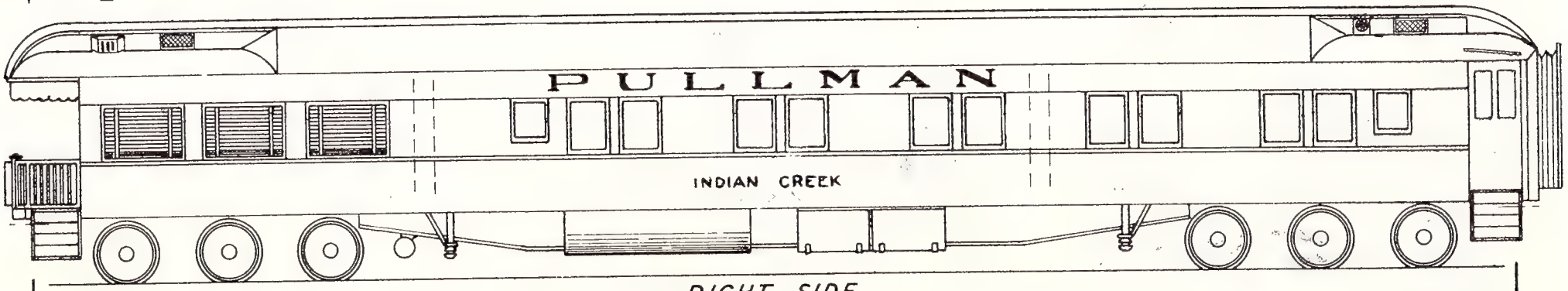
DETAILS ARE FULL SIZE FOR O-GAUGE







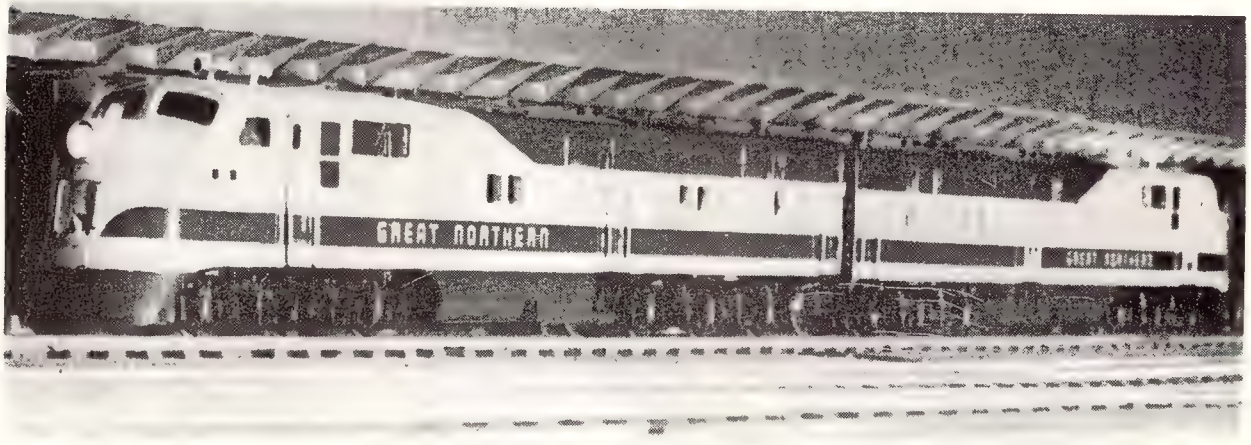




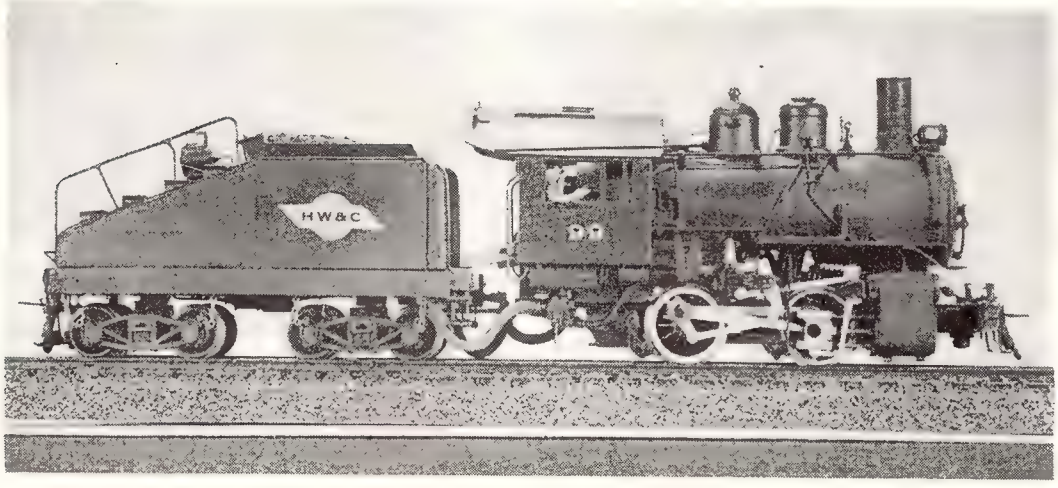
RIGHT SIDE

L. AUSTIN

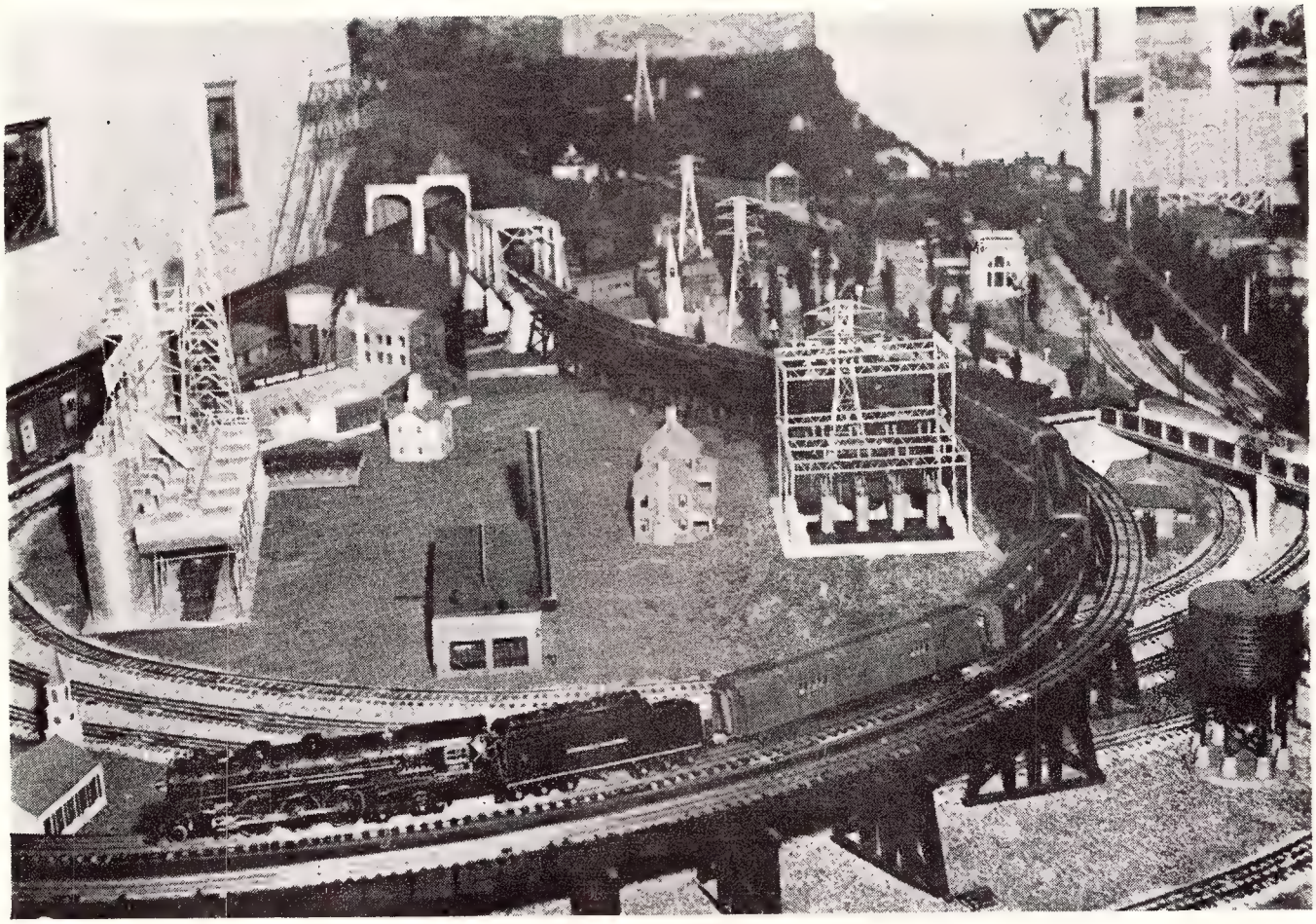
An outdoor O gauge pike, ala Denmark. The Palsdorf's Railway Company, owned by B. M. Palsdorf, embraces more than 550 feet of track built to American Standards. It's a third rail pike using 12 to 20 volts A.C. and with a signal system automatically operated at 24 volt D.C. There are 15 locomotives and about 80 cars.



A double-ended Diesel on the O gauge pike of Ben. F. Cutler, Athens, Ohio.



This HO gauge switcher was built up from scratch using plans furnished by Larry Sagle, of the B & O. It's a true replica of the B & O C-16A and operates on 12 volts, D.C. Note the piping, brake shoes and the window sash slides, a beautiful job of detailing.



A close-up of the Bussa Model Railroad as built by Chester Bussa, of Friendship, Ohio. This O gauge pike is set on a table 40 by 35 feet, one foot from the ground. The system owns twelve locomotives to haul the hundred odd freight and passenger cars.

Your Nabor's Pike

WANT THREE BUCKS?

That's what we're paying for both photo and appropriate caption appearing on this page. Two bucks for each photo without caption. Here's a good chance to let your "nabor" see your work and make some easy money in the bargain. Photos are selected on a basis of good photography and reader interest. We do not limit you to some super-detailed model, so don't be bashful—your photo may be the next to appear on this page. Include all pertinent information regarding scale, gauge and all interesting facts. Send material to Picture Editor, Model Craftsman, Ramsey, N. J. Photos will be returned on request.

A yard scene on the HO pike of Leonard Schmidt, of Milwaukee, Wisc. Two of the tracks are equipped with overhead trolleys and all engines and cars are German made "Marklin." The passenger car in right foreground is finished in red with gold striping and lettered "MITROPA." All freight cars are 4-wheel following European prototype.

THE LAYOUT DOCTOR

THE first layout to be Doctored this month was submitted by Mr. Cecil Vaughn, of Akron, Ohio. It is almost a complete revision and an extension of Mr. Vaughn's Hell West & Crooked HO Gauge R. R. which has been in existence for ten years.

As he says in his letter: "I plan to use about two-third of my present layout to save a lot of track work. There is to be one high line to hide three hidden tracks and part of one main line. Complete trains will be stored on sidings and brought out in sequence. I like the hidden track idea as it has a good effect on visitors and is the only way to change trains in rotation without point to point operation. For accessibility to the tracks, the scenery will run from level up to the high line, and then be removable over the hidden tracks from the back of the high line to the backdrop. The curves will be partially concealed by deep cuts where possible."

Your attention is called to the photos accompanying Mr. Vaughn's entry, which are, of course, of his present road which will be partially incorporated in the new one. These photos are a large factor in giving the H. W. & C. new layout priority in the pile of sick layouts I have on hand.

When a man has been operating a model railroad and observing other lines for ten years, there is not much you can tell him about railroad design even though, as he says, "I do not profess to be good at layouts." Vaughn's newly designed pike shows the results of this experience.

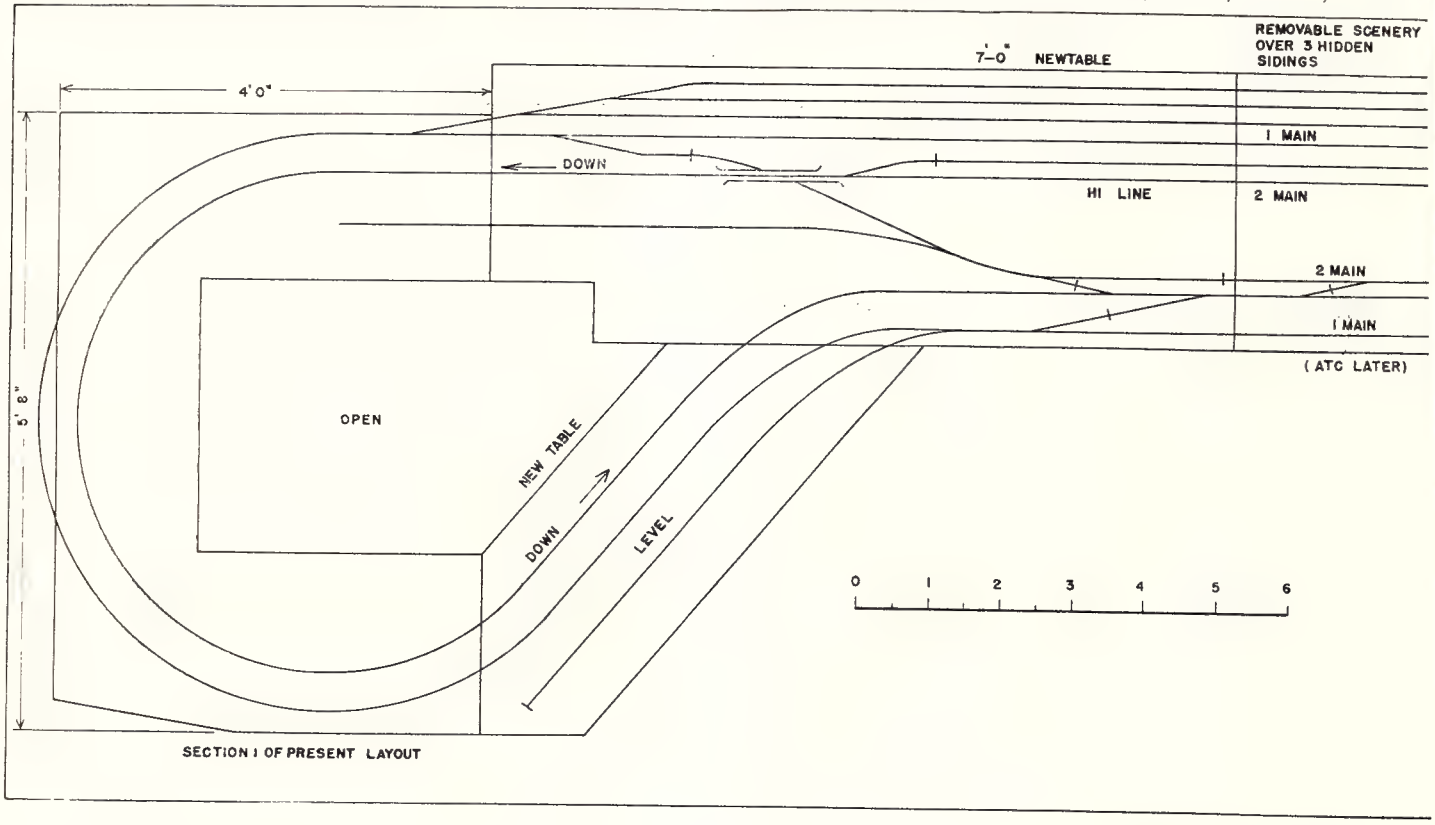
The New Hell West & Crooked R. R. is basically two separate water-wing shaped ovals with provision in the center for switching from one to the other and back again as desired. There are several of our hidden layover tracks and provision is made for reversing whole trains in motion no matter what direction and what track they are on. What more can you ask?

My principal criticism of the new H. W. & C. R. R. is directed toward the yards which are really a holdover from the old layout. As such, perhaps they may be used for a while, at least until construction of the rest of the track is done. But eventually, I believe, the yards must be improved so that the tracks will hold a few more cars each. In my small sketch I have shown one way this may be done by swinging the yard body tracks off at an angle to the main line. Thus we have five yard tracks, plus one other which can be used for make-up and for serving the freight station and team tracks.

The engine terminal facilities on the old layout are unusually capacious which is good, but with those short yard tracks I'd say we can't spare the space and should compress the engine terminal somewhat as shown in my sketch. I have also changed the direction of the cross-over at the end of the "make-up" track so that trains avoid interfering with yard operation after taking what I have indicated as the reverse loop.

My next and only other criticism is leveled at the parallelism of the curved tracks at each end of the layout. They are not close enough to be double tracks (even if on the same level) and not far apart enough to scenic convincingly. Still and all, judging by the photos, Vaughn has done a pretty good job of disguising them. And, as he says, they will be in deep cuts, when possible. One good trick for disguising parallel curved tracks that you may have noticed my using is to separate them by a river.

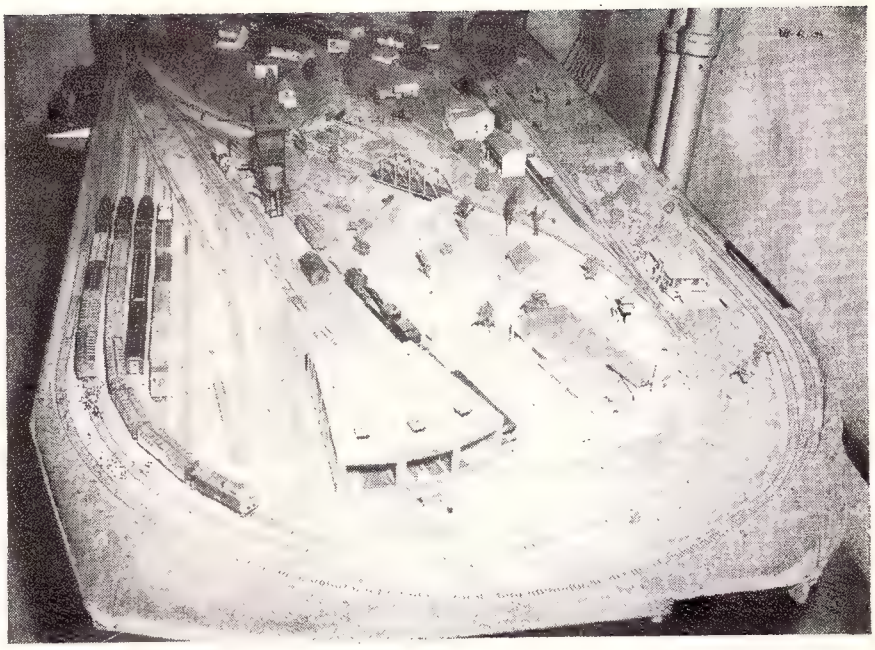
I picture a lot of fun with this H. W. & C. layout, even *without* the yard revisions I suggest. At least two trains can be kept in constant operation, with others replacing them from the layover "Bin" from time to time. These two trains, thanks to the switchwork at the narrow part of the trackage, can be interlaced from track to track, reversed, re-



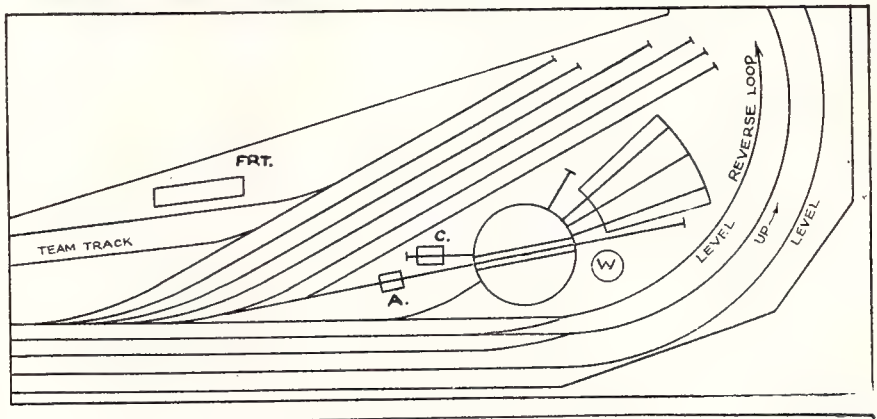
reversed and generally kept in that welter of ordered confusion that makes you think "Boy, this is sure fun!" The two-rail circuiting of the trackwork should take care of preventing any serious collisions. Later refinements especially the ATC (Automatic train control) Mr. Vaughn proposed should permit operation of three or four trains at once.

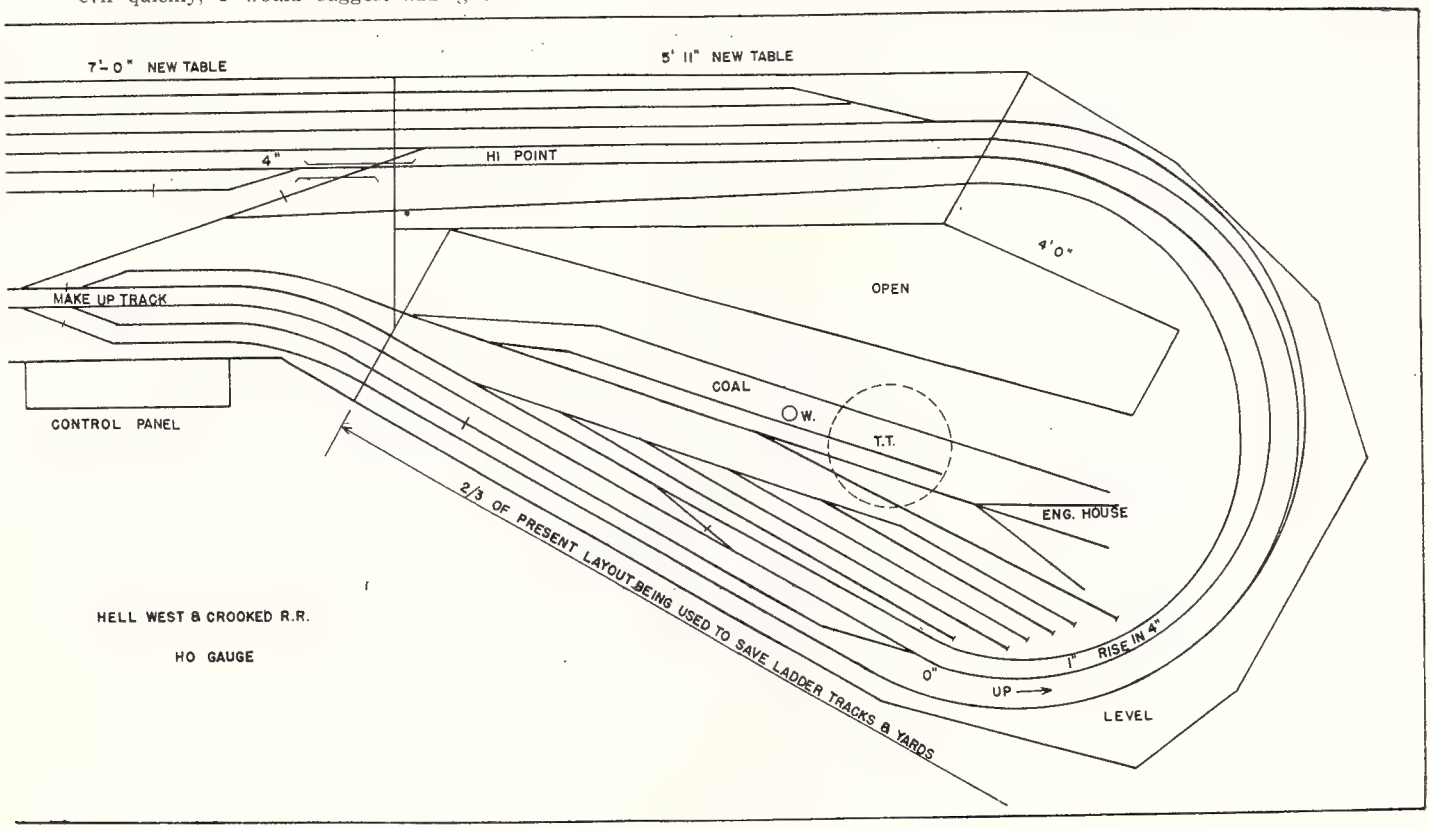
A different problem is presented by Chas. Morris, of Salem, Oregon, who runs the Mapleton addition of the Cascade Pacific, which is located, as you can see from the photo, in his attic. He is blessed with wide open space which lets him use forty-eight inch curves on the main line of his HO gauge pike—boy, doesn't that make your mouth water! He is also blessed with a wife—who has to hang her clothes in the attic when drying weather outside is not favorable. (Automatic washer salesmen please note.) This precludes his using the center of the attic for any trackage. He is confined to the edges, where the sloping eaves reduce headroom. He is cursed, I would say judging from the photo, by that open stairway to the lower floors just waiting to catch a proud modeler who steps back to admire his work. How about putting up handrails on those stairs if you already haven't broken your neck, Charles!

Morris' trouble, to quote his letter, is that he doesn't know how to finish. If you follow out the trackage on his original layout plan you will note that a counter-clockwise train can reverse itself by means of the reverse loop *across* from the chimney. However, once reversed to clockwise, a train cannot change its direction again once it has made the circuit of the main line, even though there is another reverse loop in the lower right hand corner of the plan. To correct this evil quickly, I would suggest adding a



The Hell West & Crooked R. R., below is the suggested yard revision.





facing point crossover indicated at A on the revised plan. This may be located any place on the double track between the two reverse loops.

I have also added a crossover B at lower right center so that the long double track at the bottom of the plan can be utilized for a passing track. This can also be used to run a freight around a passenger train sitting at the station which I suggest be built *around* the chimney.

What is really troubling Morris, I suspect, is the arrangement of the yards on his layout. I judge this from the numerous small yards dotted into his plan as "projected." I suggest that the yard lead run from the aforementioned crossover B parallel to the main line down almost to crossover A. This is in reality another passing track or track for running an engine around a train. The yard tracks will spring off this naturally into the area to the right of the chimney. If number six switches are to be used, they must be paired together before switching into the lead. Number four or the "missing" number five switches could no doubt switch directly into the lead without pairing up.

At the opposite end of the yard lead can be the engine house which I suggest be of the rectangular variety. A turntable will not be needed since two reverse loops are handy.

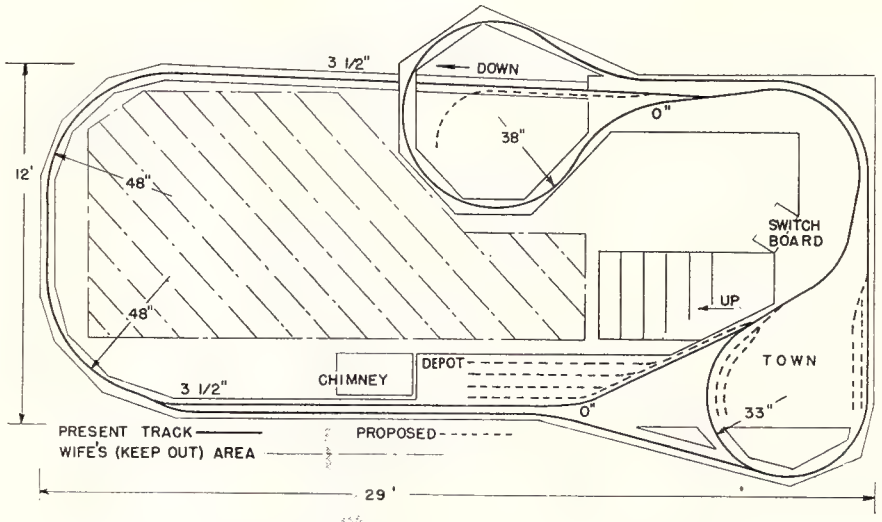
The yard track nearest the wall (and nearest the main line) can also serve a passenger platform, although if the platform is omitted an extra yard track can use the same space. The yard track nearest the edge and the wife's clothes line space may at some future time be extended past the chimney and split up for more yard space.

I believe the two smaller yards indicated on the original plan can be omitted in view of the larger space available in the yard I have designed. Instead, industries, freight stations, and so forth can be put near those places to provide traffic for the Cascade Pacific.

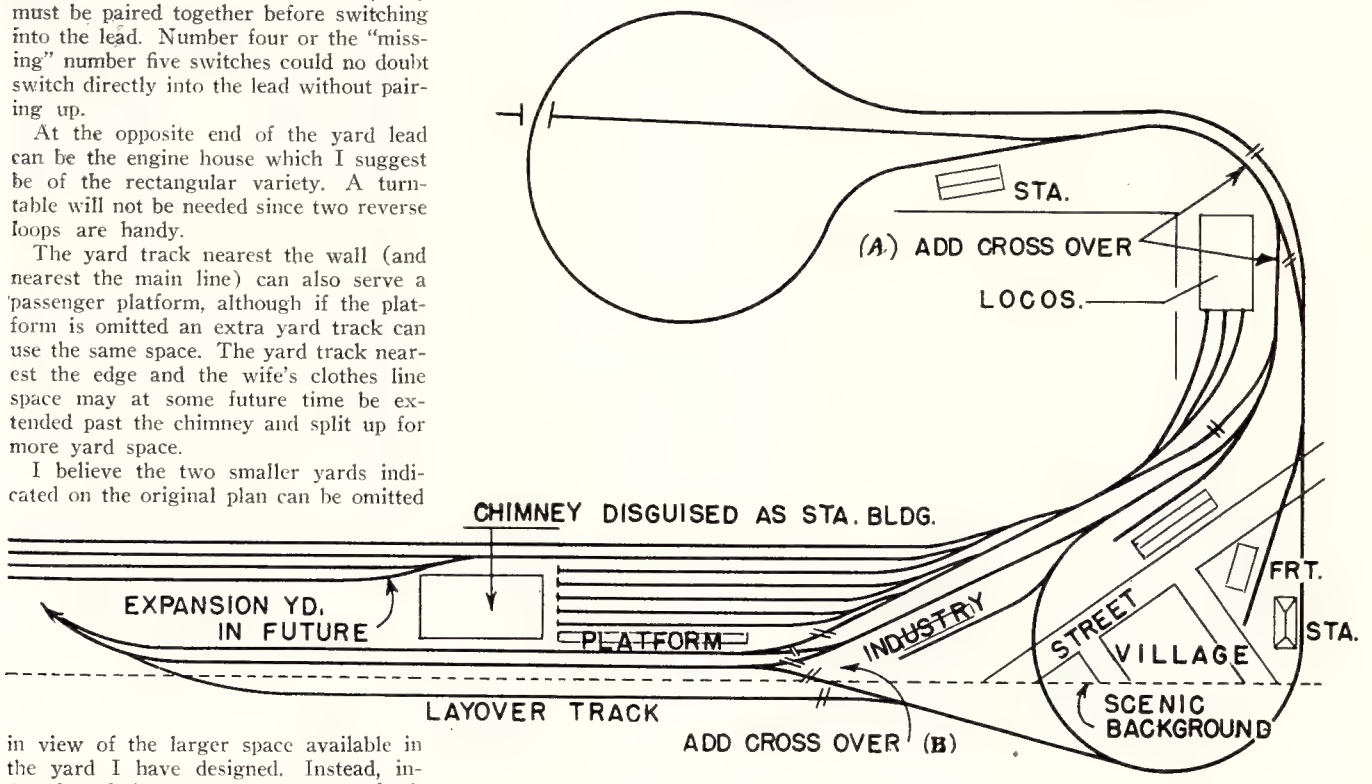
Suggested breaking up into sections for two rail is shown. Each passing track is a section, as well as the yard lead with yards and engine terminal. One reverse loop is affiliated with the adjacent main line, while the other is separate. The layover track is also a separate control section.

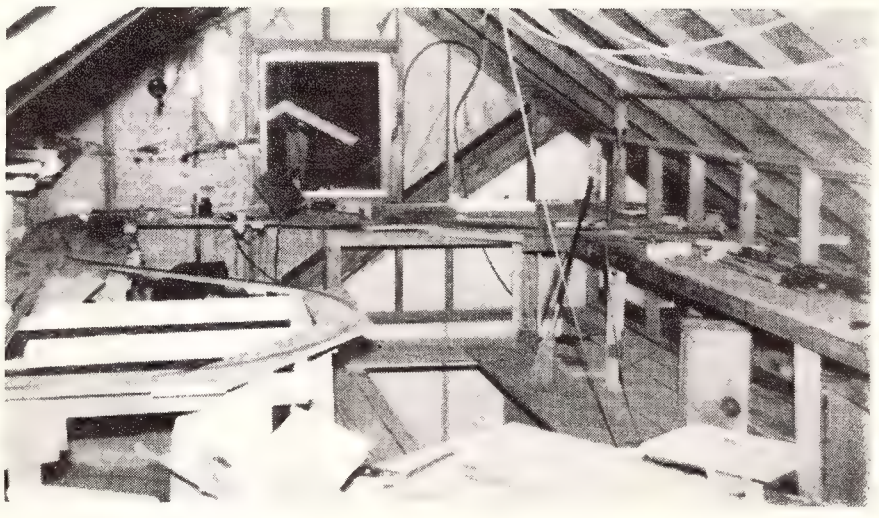
The layover track can run along directly behind the scenic background. One of its switches is in front of this background, while the other should be easily reachable by removing a portion of the scenery.

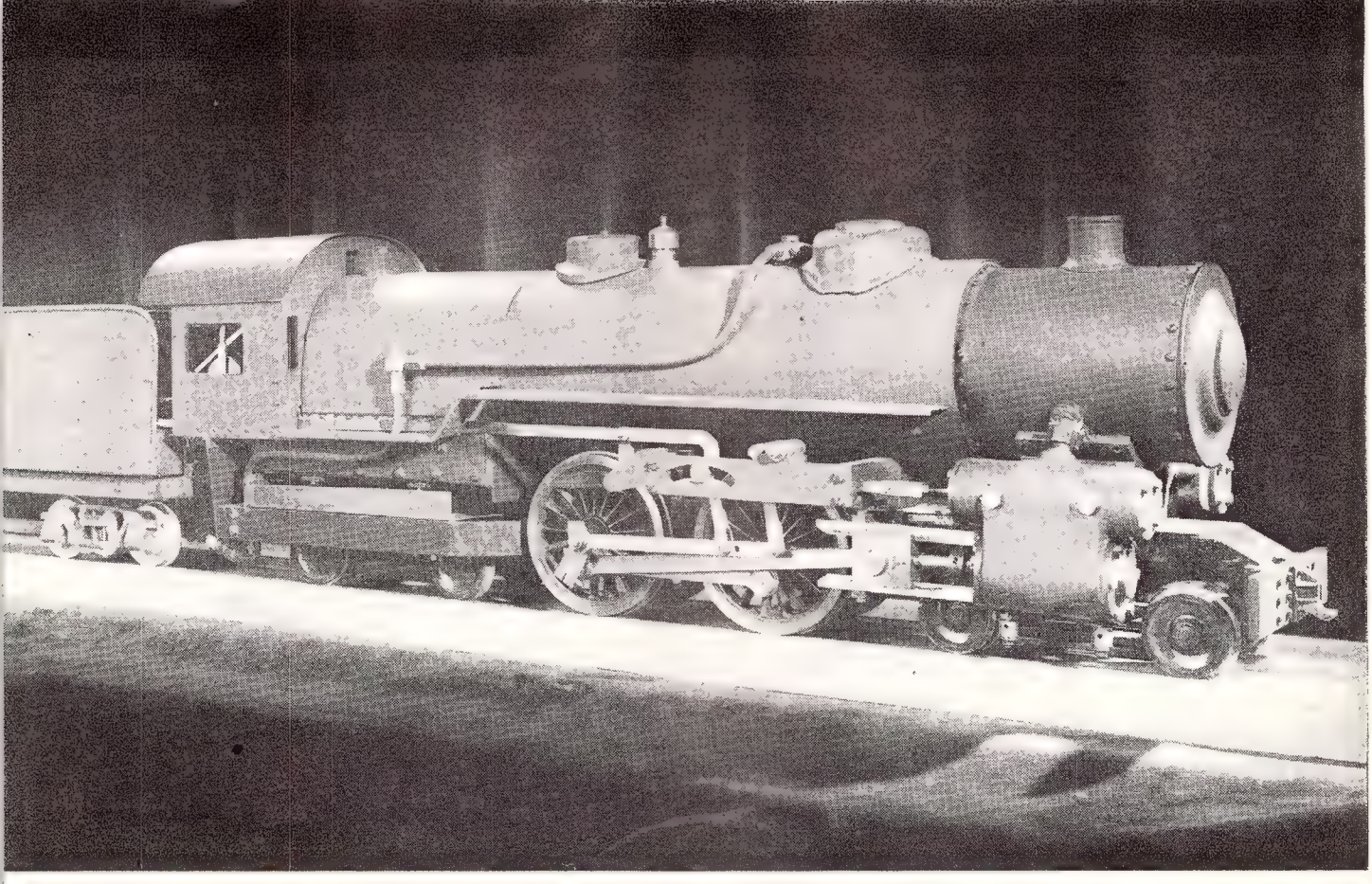
Although not very clear, the over-all photo of the Morris attic showing layout, wash lines, extension cords, broom, etc., represents what might be a typical "under construction" model railroad scene, although it may be placed in the cellar or spare room instead of the attic.



Above is the original Cascade Pacific, the revised layout is shown below.







4-4-4 Live Steam Locomotive

PART I

By H. J. COVENTRY

THIS engine has been designed particularly for the large and increasing number of model enthusiasts who are just starting out or have limited experience in live steam. A large correspondence shows that the steam locomotive takes premier place and to build a model locomotive is the big desire of the inexperienced beginner. It is not easy to reconcile inexperience with the desire—more than one prospective good model maker has become discouraged by taking on a too ambitious job for a start.

In order to meet this situation, a design has been developed which is simple and straightforward without being too great a departure from regular locomotive practice. With these few words of apology it is hoped that the subject of these notes will make many more friends among "live steamers" and would be live steamers.

Before passing on to the actual construction of the engine, it may be of interest to discuss briefly a few general principles of all locomotives, big and little. No doubt the reader has encountered the terms "Tractive Effort" (TE), "Draw Bar Pull" (DP), and "Factor of Adhesion." Tractive Effort or sometimes called Tractive Force, is that force which is developed between the rim of the driving wheel and the rail and depends upon (1) steam pressure in cylinder (2) piston diameter, (3) stroke of piston, or twice the crank radius, and (4) diameter of driving wheel.

Now the tractive effort may be increased without limit by suitable changes in these four items, but a very definite limit is imposed by the Factor of Adhesion. It must be remembered that all locomotives can only proceed due to friction between rail and wheel and this bears a definite relation to the weight on the driving wheel and it is this ratio of Tractive Effort to Weight on Drivers that is known as the Factor of Adhesion. This factor is usually between 3 and 5, or in other words, we may design for a TE, one third to one fifth of available weight on drivers. So the greater the weight that can be put on the drivers the higher does the TE become, but here again a limit is imposed in full size locomotives by track structure, road bed and bridges—so the maximum weight on any one axle is limited to about 35 tons. It may be readily seen that to provide high TE a number of driving axles must be provided.

The TE of any locomotive at starting and low speed is limited by its cylinder dimensions, while at high speed it is limited by its boiler capacity. In other words, a set of cylinders may be quite capable of hauling a definite load at high speed if boiler has sufficient capacity, but yet be too small to start the same load. These few facts are fundamental to all locomotives regardless of size, hence any design calls for a judicious balancing of all factors to meet the desired service to which the engine may be put.

It will be apparent from the above why modern locomotives have multiple coupled drivers and it will also be noticed that if we could place more and more weight on each driver-axle we could cut down the number required. This is exactly what we can do in a model locomotive because we are not bothered by "axle load limit." Herein lies the reason for adopting the 4-4-4 wheel arrangement. It permits a large boiler and firebox, and as nearly all the weight can be placed on the drivers, large bore cylinders are permissible.

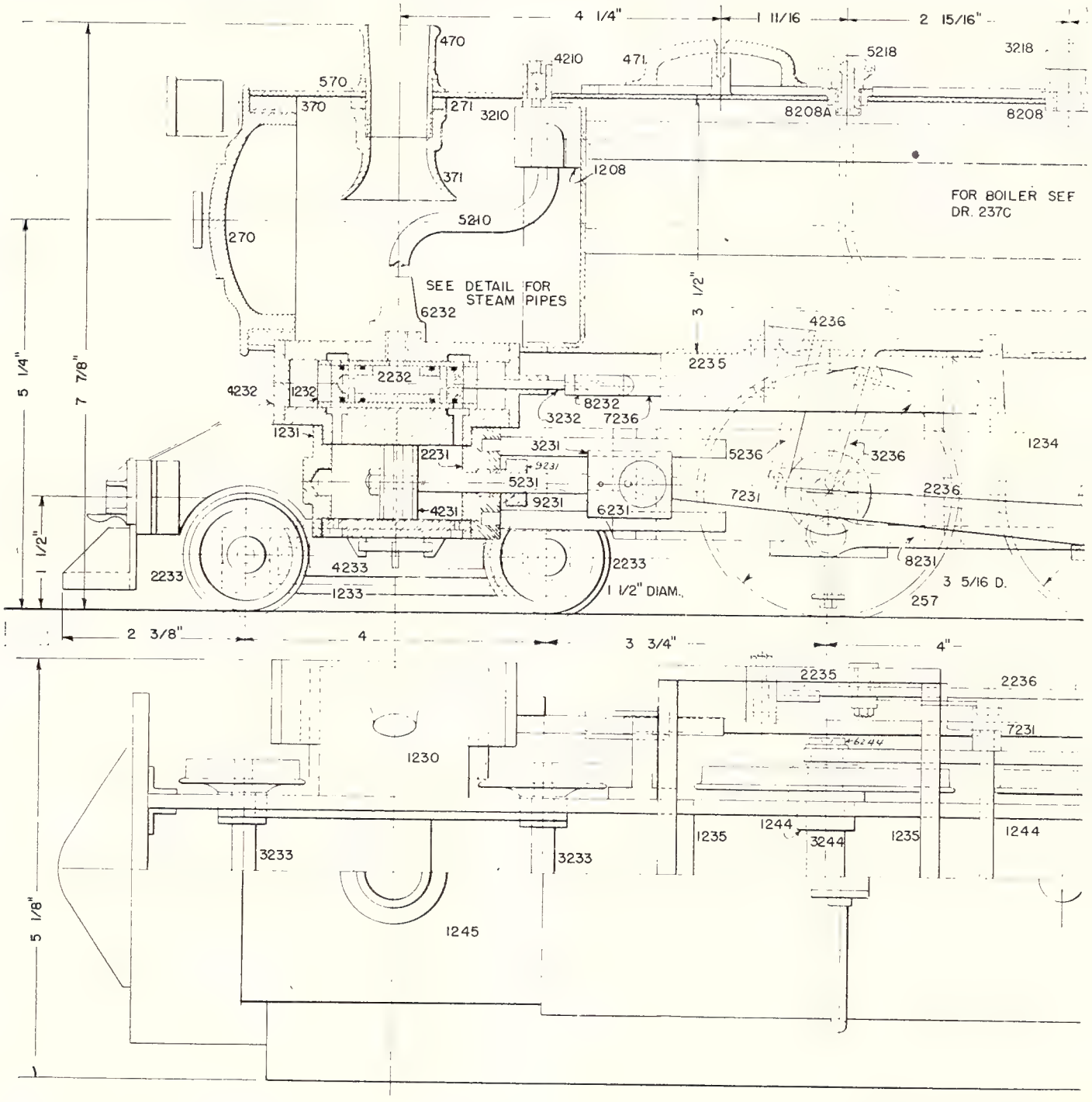
The sectional arrangement drawing accompanying this article shows all the principal features and hardly needs comment at this time, except perhaps the design of the piston valve. Experience

shows that most amateurs dislike regular piston valves owing to difficulty of making satisfactory rings that are steam tight. To overcome this objection, a hollow drum type of valve was designed, having port slots cut in, in proper relation to main ports in cylinder. Grooves are turned in the drum which are to be packed with graphited asbestos. The drum does not have to be lapped in and is no harder to make than a soft packed piston so often used in model engines. The ports in the valve chamber bushing take the form of a number of holes. Curiously enough, after this valve was designed it was discovered that a patent was taken out in England in 1832 for a locomotive piston valve of the same principle—so the piston valve is very much older than is generally known. The valve gear is Southern Type, the fixed link of which is easier to make and less sensitive to errors of workmanship.

The trucks, front and rear, as also the tender trucks are all alike and axles are carried on spiral springs. Self lubricating "Oilite" bushings are provided for truck bearings so no lubrication is required. The main bearings (drivers) are of bronze and will require oiling.

The boiler will be of copper, the flanged plates of which should not be too difficult with proper method of procedure. The throttle is somewhat new in detail as it is capable of being removed as a unit, (there being no soldered or brazed joint) if it should become necessary at any time after engine is built. Other features will be taken up, as we come to the details, but it is suggested that the newcomer study the sectional drawing as it will give a better idea of the whole job, before proceeding with the details. Each part will have its own number made up as a combination of part number and drawing number, the first digit is a part of piece number to be found on drawing indicated by following digits, thus—8231 is the item 8 on drawing 231. All threads are standard U. S. form for which taps and dies are easily obtained from good machinists' supply houses.

Although the engine has been designed with a view of avoiding expensive tool equipment, a lathe of 7 or 9 inch capacity is necessary, although only the cylinders and main drivers would require a lathe this size. If these two items are finished a small bench lathe and slide rest is all that would be required. A light drill



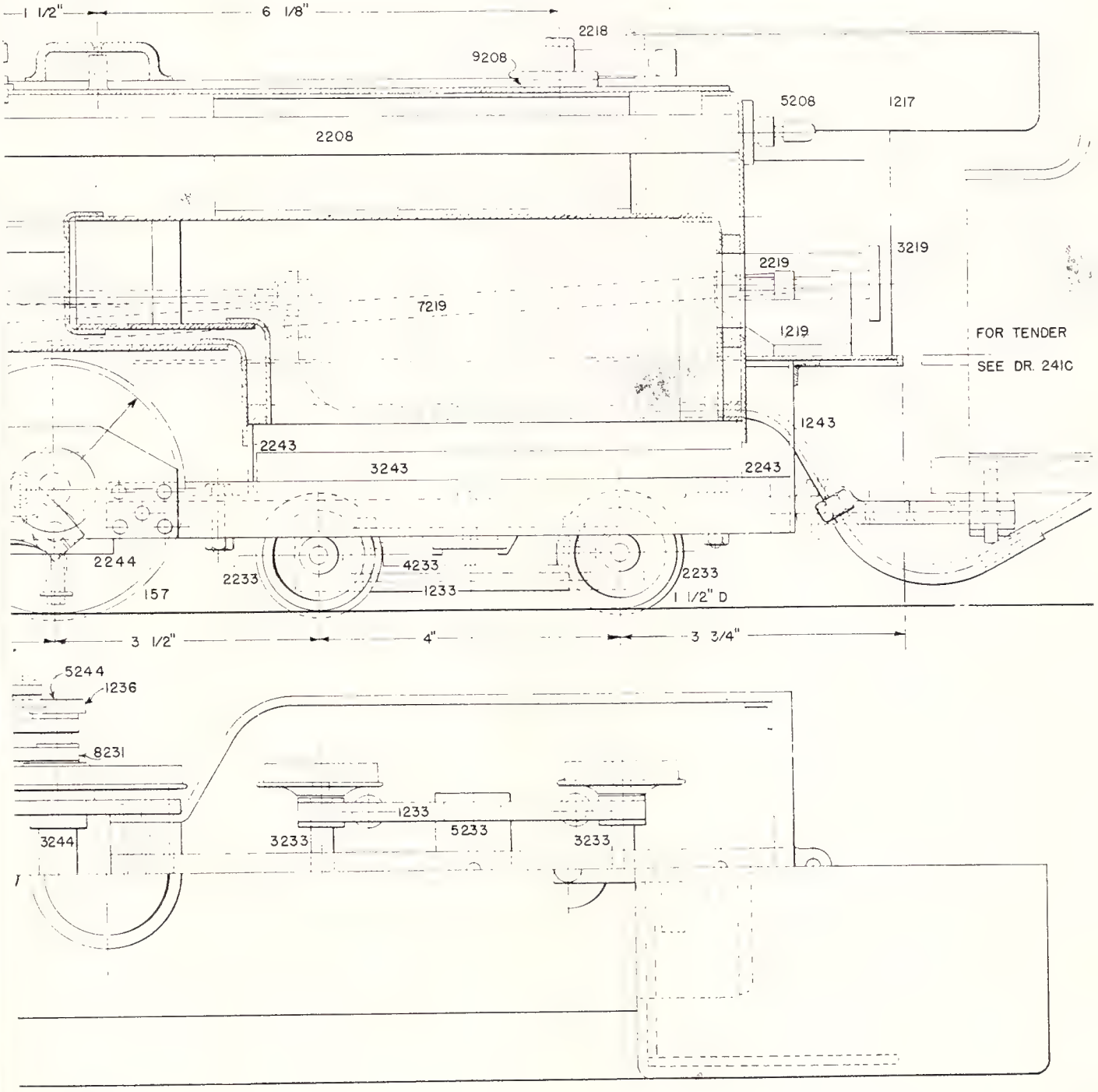
taking up to ¼ inch is useful and, of course, the usual equipment of small tools such as a square, calipers inside and out and a one-inch micrometer.

Now we will start with the Main Frame Drw. #234 and the following material: 2 pieces of soft steel or cold drawn steel 1½" x 3/16" x 14¾" long and one each of the following: 1" x 3/16" x 5" C. D. S., ¾" x 3/16" x 5" C. D. S., ¾" x ⅛" x 10" soft steel, ½" square x 10" C. D. S., ½" x 7/16" x 2¼" C. D. S., and ½" x ½" x ⅛" steel angle 7" long.

Steel for the main part of frame as purchased may be one of two grades, either a strip sheared out of bright cold rolled soft steel sheet 3/16" thick, or of bar cold drawn 3/16" x 1½". In the former case, it is as well to have the shearing about 1/16" wider so that the edges may be filed square with flat surfaces. If a C. D. bar is used, this will be exactly 3/16" x 1½" and no filing will be necessary to edges. After the cutting out is done, the bar will warp somewhat, that is the top edge will no longer be straight as originally. The sheared sheet stuff will not warp, however, either material is quite suitable if the above precautions are taken.

So assuming we have a straight edge to start with, clean off any grease and coat with any "marking out fluid." Copper sulphate solution is the old well known fluid, but good hardware stores generally stock ready made colored materials which dry quickly and are easily cleaned off with alcohol. Lay the steel edge down on a surface plate (a piece of thick plate glass gives good service) and scribe the center line 21/32" up from bottom edge and cylinder center line ¾" above the edge. Then with the square, mark off all the vertical main center lines and the centers for drilled holes, except the holes which are marked to be drilled or tapped from some other part. Having marked out all holes, prick punch and then drill one of the cylinder holes, say top left hand hole, also the middle holes lying on cylinder center line at the 3⅝ and 3⅞ locations. Drill these ⅛". Now place the other piece of steel alongside with edges exactly level, clamp together and drill through the three holes before removing clamps, put a copper rivet in each hole and rivet over lightly. The frames may now be cut out and drilling completed.

(Continued on page 33)



The Atwater-G.M.

THE
IN M

YOU'VE wanted it—you've waited for it—and now, at long last, it's here—the Atwater-G.M.C. Diesel for O-gauge operation. Fourteen months of research, engineering and preparation have gone into the making. In no detail has realism been compromised and no expense has been spared, to give you a perfect replica of the prototype—the F-3 Freight Diesel.

Here are some of the outstanding features!

Complete Prototype Detail

- Roof, sides, and ends are cast separately with tongue and groove alignment and assembly.
- Every surface detail duplicated to exact scale replica of the prototype:
  The number and spacing of rivets and nuts are exact;
  All ventilating louvres faithfully reproduced;
  Acetate screens and windows;
  All grab irons, lift rings, hand rails, and operating coupler release rings as in the prototype are supplied and preformed;
  Even the swedged hand rail ends are a part of the side detail.
- Authentic roof ventilators, intake and exhaust stacks.
- Monarch operating couplers.
- Flexible metal and fiber diaphragms perform realistically.
- Nose detail includes acetate windshields and cab windows; optional (but included) dual headlights complete with bulbs, lenses, and sockets fitting light compartments in the nose; number boxes and choice of color indicator lights that are actually illuminated; Monarch operating coupler on nose with complete lift rigging detail.
- Truck side frame detail includes air tanks, complete sway bracket assembly, brake shoes and rigging, journal boxes, end bars that permit equalization, wheel axles run in replaceable, self-aligning journal bearings.

C. Diesel is here!!

This is an actual photo of the Atwater Diesel.

OST IMPORTANT ANNOUNCEMENT DEL RAILROADING HISTORY!

All parts are completely drilled and tapped, thus making the simplest screw driver assembly kit ever manufactured.

More power

In order to provide power in keeping with the high quality of the Atwater Diesel, G.M.C. engineers have designed a new type power transmission that permits equalization and distribution of weight through bolsters to the self-aligning journal bearings. The new double-shafted motor provides extra power and smooth . . . smooth operation. Minimum radius — only 20″.

All of these features and many more at these amazing, low —

Prices

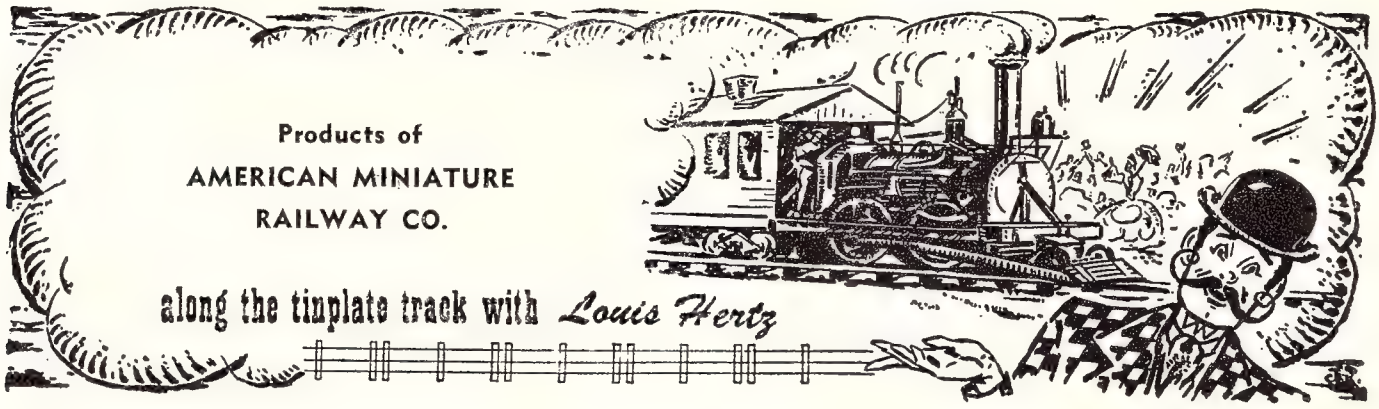
Dummy A Units	$33.50
Dummy B Units	29.50
Single-truck drive assembly, including motor	16.00
Additional single-truck drive assembly, less motor	8.50

The Atwater-G.M.C. Diesel is available at your dealers after January 7. See it! You'll agree that there is nothing finer in model railroading.

GENERAL MODELS CORPORATION

"Transportation in Miniature"

703 CHILDS STREET WHEATON, ILLINOIS



INTEREST continues to abound in that short-lived, but extremely intriguing early clockwork train manufacturer, the American Miniature Railway Company, of Bridgeport, Conn. There are several natural reasons for this interest: the fact that the AMR Co. was formed when two Ives tool-makers and designers were induced to leave Ives for the new company and, as a result, many of their models and their numbering system closely paralleled Ives'; that the company was in business for such a comparatively short time—making trains from 1907 to 1912—yet had a very extensive line, and finally, that they did create certain important innovations which were copied by more successful firms.

It is not our intention here to cover the same ground in connection with the history of this company which was presented on these pages in the April 1944 and May 1945 issues, but rather, in answer to requests to explore more fully the details of the line itself, with particular reference to their duplication of Ives numbers and designs and their own innovations.

When the American Miniature Railway Co.'s line was first launched, the motive power consisted of a small tin 2-2-0. This was virtually identical in appearance to the corresponding Ives locomotive, and carrying the same numbers, 0, 1, 2 and 3, depending on the adjustment of the motor for the number of cars it was designed to pull. The tender, however, was somewhat larger than the Ives No. 1 tender and more closely resembled the Ives No. 11 tender. However, in precise form, it is obvious that it was from the design of the AMR Co. No. 20 tender that the familiar American Flyer No. 120 tender later was copied.

The other locomotives in the original AMR Co. line were the cast iron No. 11 and No. 17, which although of different design corresponded to the Ives locomotives of these numbers. They were identical except that the No. 17 was fitted with a brake. The larger AMR Co. tender was their No. 25, the same number as Ives' largest O gauge tender, but ¾" shorter. There were also 4½" and 5" passenger cars. One innovation in the 5" series was a car lithographed "Dining Car," otherwise identical to the "Parlor Car." There was also a 5" four wheel caboose, No. 90.

In 1908 an iron 2-2-0 for the 0, 1, 2 and 3 sets was brought out, the tin locomotive being continued. In the 1910 price list these engines are listed only as the "No. 0 Tin Body" and the "No. 0 Iron Body." In 1908 they also introduced freight cars and complete boxed freight trains. In their 1909 catalog they claimed that during the season of 1908 they were the only manufacturers to sell freight trains in sets, "and the departure proved so popular that we have increased the line of 'Freights' for 1909." This was not entirely a "departure," as claimed, for Ives had made freight sets previously, but only one or two at a time and there is only one freight set listed in the Ives 1907-1909 catalog. It was a deluxe set with the largest locomotives and cars. The five freight sets in the 1908 AMR Co. catalog are mainly low priced sets with small 4½" cars, so the credit for extensively introducing inexpensive freight sets in American clockwork trains should perhaps justly go to them.

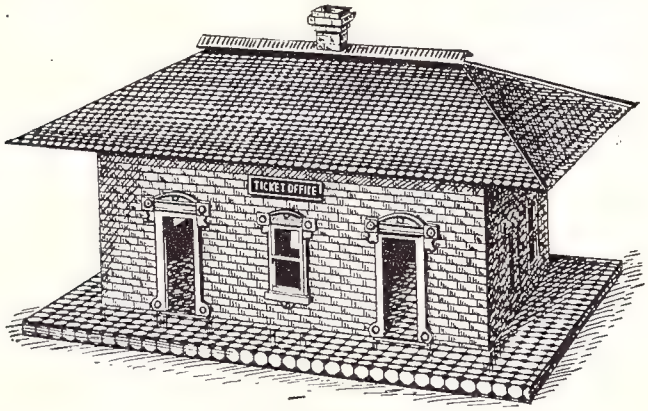
Ives did introduce some new 4½" freights in 1908, precisely which types is not yet certain although it is known they included the first No. 53 box car, and the line already included the No. 54 gondola. The 1908 Ives cars, on the old 4½" lithographed underframes should not be confused with the more familiar 5" cars of the same numbers which came out in 1909 to counter the 4½" AMR Co. introductions of 1908. It is obvious that things were rather nip and tuck between Ives and the AMR Co. for a few hectic years. The Ives line by 1910 consisted of the No. 53 box ("Freight Car"), No. 54 gondola ("Gravel Car"), No. 55 stock car, No. 56 caboose and No. 57 lumber car.

You may judge the influence of the AMR Co. on this array by noting their line-up of types in 1909, and the duplication of the numbers 53 and 54 for virtually identical cars in both lines. In 1909 the AMR Co. offered a No. 51 stock car, No. 52 refrigerator car, No. 53 "freight car," No. 54 "gravel car" and their previous 5" No. 90 caboose. The refrigerator car differed from the freight car only in the lithography.

In passenger cars, in the 4½" series, Ives' No.s 50, 51 and 52 were matched by AMR Co.'s 97, 98 and 91 but the 98 and 91 were also made with different lithos under the No.s 93 and 95 respectively.

In 1909 the AMR Co. had eight wheel freight and passenger cars as well, a cattle car No. 162, freight car and re-

OUR NEW PASSENGER STATION, NO. 121

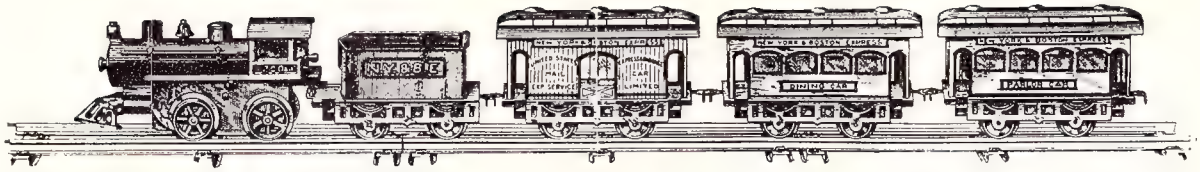


Dimensions, 13½ x 9¾ inches.

THE above cut represents our new 1908 Passenger Station for toy railway systems. We put this out in richly lithographed colors, and it is made in a most finished and attractive style. The price, we are certain, will be of interest.

THE AMERICAN MINIATURE RAILWAY CO.,
BRIDGEPORT, CONN.

This catalog insert sheet introduced the American Miniature Railway Co.'s new station in 1908. It was virtually an identical copy of an Ives product. The door, window frames and chimney were castings.



A typical American Miniature Railway Co. O gauge clockwork train set of around 1908. The locomotive is their earlier model No. 17. The "Dining Car" was the first so designated in American tinplate and it remained the only one for almost two decades.

frigerator car No. 2 163 and 164 and a "Gondola Car" No. 160 which was sold with a different litho as No. 161 "Coal Car." These were 8" cars, and the corresponding passenger line consisted of four entirely different numbers, baggage car No. 151, combination car No. 150, passenger car No. 152 (narrow windows), and parlor car No. 151 (wide windows, like an Ives No. 129). The competitive Ives line consisted of only three types, lacking the passenger car. The AMR Co. combination car had wide windows, while Ives' had the narrow design.

The AMR Co. line of O gauge locomotives was eventually rounded out with a No. 9 (like the No. 11 but without handrails), a No. 15 with brake and speed governor which replaced the older 6¾" No. 17 in 1909, and a new 8" model, made as the No. 17 without brake, as the No. 19 with brake and as the No. 21 with brake and reverse.

The American Miniature Railway Co. also introduced No. 1 gauge trains in 1909, the No. 35 0-4-0 and the No. 41 4-4-0. Ives' numbers were No. 40 for their 4-4-0 and No. 41 for their 0-4-0. The AMR Co.'s No. 1 gauge eight wheel tender was their No. 50. There was a series of 12" freight and passenger cars, again containing four types of passenger rolling stock: mail car No. 170, combination car No. 171, parlor car (narrow windows) No. 172, and parlor car (wide windows) No. 173. Ives numbers on similar cars were 70, 71 and 72. The AMR Co.'s freights in No. 1 gauge were No. 180 gondola, No. 181 stock car, No. 182 freight car, No. 183 refrigerator car and No. 190 caboose.

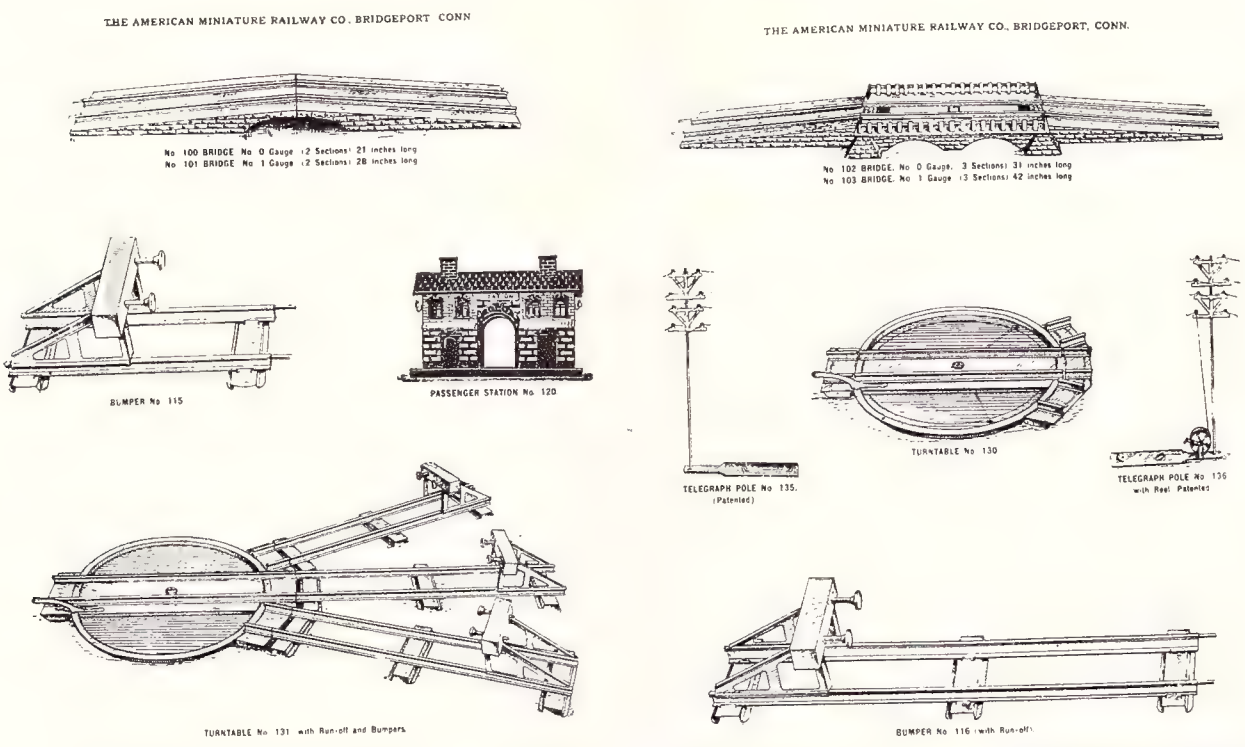
The last cars introduced for track trains were still more numbers in the 4½" line. Presumably they differed only in the lithography. By 1910 there were no less than ten numbers in the three body styles. The numbers ranged from 89 through 99, excepting 90 which had, of course, already been assigned to the four wheel caboose.

Another 1910 innovation was a line of trackless floor trains, retailing from $.50 to $2.25, and corresponding to the similar Ives line. Even the numbers here were in some cases similar, if not identical on the same sets. Ives' numbers ran from 301 to 336, representing four series. The AMR Co.'s numbers comprised three series, numbers 325 to 343. The bodies of the regular track trains' cars, mounted on special underframes and with flangeless wheels were used in these sets.

The foregoing comprises virtually a complete catalog of the entire line of trains manufactured by the American Miniature Railway Co. It will be seen that the line was not entirely or as nearly simply a copy of the Ives line as has in the past sometimes been believed. In their range, for example, of four rather than three passenger car types in the O gauge eight wheel and the No. 1 gauge lines they were actually a notch ahead of Ives. There were a few original and patented mechanical features incorporated in the line, including the type of coupler which was later made familiar on American Flyer wind-up sets as the "Disappearing Coupler." This consisted of an ordinary hook type non-automatic coupler working in a short slot, so that when a train is halted the cars will "close up" pulling apart to the full length of the coupler play when running.

Another interesting patented American Miniature Railway Co. feature was their "Signal Post," actually a switch stand which was a rather realistic vane type stand somewhat similar to the switch stands used by Ives in the 1920's. Two complete lines of switches (both ordinary turnouts and parallel track switches) and straight and curved track sections with

(*Continued on page 38*)


THE AMERICAN MINIATURE RAILWAY CO., BRIDGEPORT CONN
No 100 BRIDGE No 0 Gauge (2 Sections) 21 inches long
No 101 BRIDGE No 1 Gauge (2 Sections) 28 inches long
BUMPER No 115
PASSENGER STATION No 120
TURNTABLE No 131 with Run-off and Bumpers
THE AMERICAN MINIATURE RAILWAY CO., BRIDGEPORT, CONN.
No 102 BRIDGE, No 0 Gauge, 3 Sections) 31 inches long
No 103 BRIDGE, No 1 Gauge (3 Sections) 42 inches long
TELEGRAPH POLE No 135. (Patented)
TURNTABLE No 130
TELEGRAPH POLE No 136 with Reel Patented
BUMPER No 116 (with Run-off)

These two pages from the first catalog of the American Miniature Railway Co. show virtually all the accessories manufactured by them during their brief career from 1907 to 1912. The station was undoubtedly imported; the other items were made in their own factory in Bridgeport, Conn. The turntable track arrangement is more realistic than found on most tinplate replicas of this piece of equipment.

Quartering Your Drivers THE EASY WAY

By HERMAN H. MITCHELL

With the universal fixture described here and a drill press, you can quarter any size drive wheel for your O gauge locomotive accurately and easily.

THE term "quartering" means locating two crankpin holes on a pair of locomotive drivewheels, 90 degrees apart, on a certain radius of one-half stroke. In prototype practice, this is done on a special machine—the *Dictionary of Locomotive Terms* describes this machine as ". . . a special design of horizontal boring machine that is used exclusively for boring crankpin holes in locomotive driving wheels. These holes must be 90 degrees apart and are bored after the wheels are forced on the axle." We shall follow this practice almost to the T, only our boring machine is of vertical design and commonly called a drill press.

On electrically driven steam type locomotives, it is not so very important whether we quarter at exactly 90 degrees or at 85 or 95. Also it is not important whether we obtain the same throw on either side of our engine. I dare any modelmaker to notice at a glance or after a test run that our locomotive is quartered at 82 degrees and that the stroke is .010 of an inch more or less on one side than the other. But, it is very important that the original error on your first pair of drivers be repeated on all pairs of drivers. The fixture that we are going to build will insure just that.

After a glance at the accompanying drawings, we find that the following materials are needed: A piece of 3/16" thick cold rolled steel plate, about 2½ by 5 inches. A piece of 3/16" thick cold rolled steel bar at least 6" long. About 8" of 5/16" dia. drillrod. A piece of ½" diameter cold rolled steel, roughly 4" long. Almost 10" of 3/16" diameter brassrod, and about a foot of 1/16" diameter drillrod for pinning.

The only special tools required for the job would be a 5-40 tap and die, but if you happen to own a number four set, you may use them as well. So, let's get started.

Figure 1 shows the clamping plate of which we need two. Lay them out on your 3/16" plate and rough-cut them with either a hacksaw or on your metal cutting bandsaw. If you own a milling machine or a milling attachment for your lathe you won't have any trouble finishing them to the size shown on drawing. If you are less fortunate, use the good old handmiller—the file. Start off by filing the outside right angle, filing the plates one at a time unless you are sure you can file squarely. Having established these two edges at right angles, file the ½" square cutout parallel to the outside edges. The precision of quartering depends on how closely you can do this. Use a micrometer and a smooth file carefully so as to obtain all four "A" dimensions equally. In the drawing, dimension "A" equals one inch. Whether you come out over or under this dimension is unimportant as long as you get all four "A's" equal. Now, with a rough file, smooth all other sides down to the line. Break all corners and edges then drill and tap the 5-40 holes as shown.

Next we lay out the 5/16" diameter reamed holes. Best with a Vernier height gauge on one plate only. If you don't have a height gauge, take a ¼" ground toolbit and hold it alongside the clamping plate on a surface plate or your drill press table. Scribe carefully. Repeat procedure on the other edge and centerpunch at the intersection. Swing 1⅞" from there with dividers that have been sharpened to give you a hairline. After centerpunching, clamp the two otherwise finished plates together for drilling. Be sure they are lined up properly with each other.

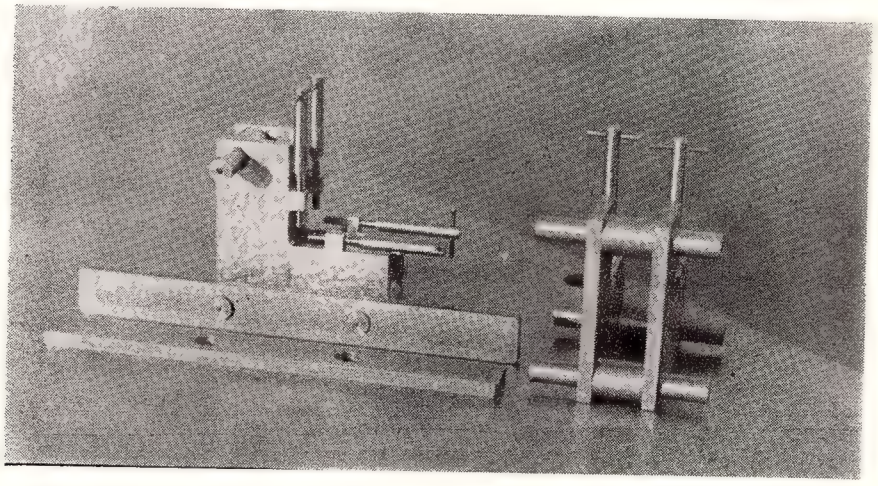
Start about a #50 drill and work your way up to 19/64" or "N" drill and ream 5/16 carefully. Remove clamps and all burrs from the six holes. Run a file across the plates to be sure all high spots have been removed. You can now hard or machine scrape these plates, however, it won't make them quarter any better. Indexing mark on one plate only.

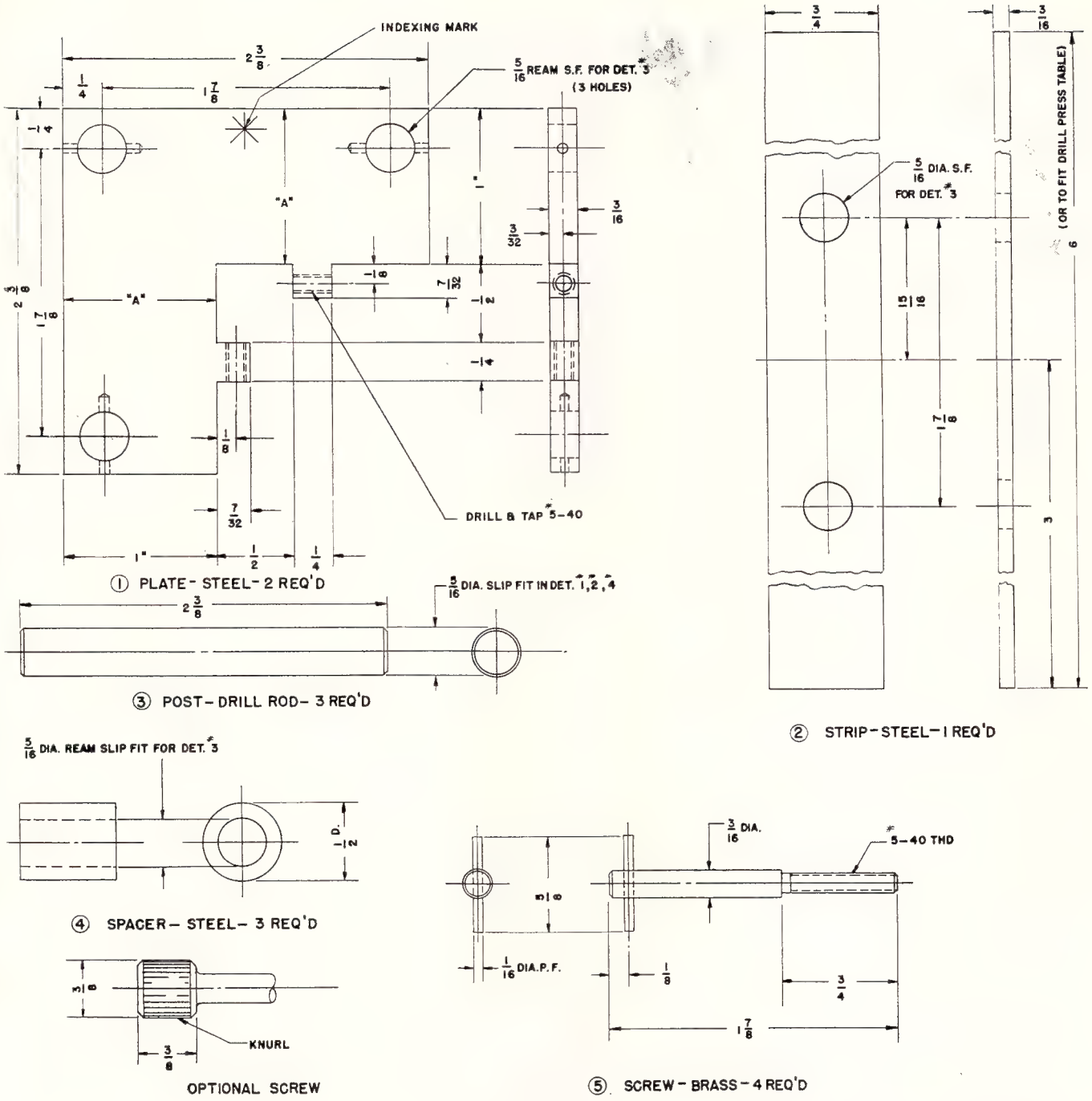
In drawing #2 we find the indexing strip. Nothing fussy as long as the two reamed holes coincide with all pairs of reamed holes in the clamping plate. Also, they should be an easy slide fit on 5/16" drillrod. Since you are going to clamp this strip to the drill press table later on, it is wise to make it as long as the table is wide.

Next, we take our drillrod and cut off three pieces as per drawing. To be sure that they are of equal length, you should part them off somewhat longer. Provide centerholes on each end and face off to the required size. The centerholes prevent false mic readings and eliminate rocking on the tiny tip that usually results from facing at the very center. The 2⅜" dimension is not too critical, however, all three legs should be within .002 of each other. Break edges and move on to drawing #4.

Start by parting off three pieces of ½" cold rolled steel. Again, part off slightly longer than needed. Hold them in a collet or three jaw chuck and drill, ream or bore for a pushfit, not a forcefit, on the drillrod. After that, you turn a small spudarbor with a slight taper on which the bushings are placed for finish facing. The ⅝" length is, as above, only critical insofar as all pieces should be within .002" of each other. Again, break all edges.

If you decide to use a T-handle clamping screw, use 3/16" brass rod. For a knurled screw, use 3/8" rod to get a better grip. The screws are made from brass because: it will not mark the driving axles and should you strip the threads it will be easier to make new screws than new plates. Turn either size down to 1/8" and run on the die. Adjust the die for a rather tight fit in the previously tapped




INDEXING MARK
5/16 REAM S.F. FOR DET. #3 (3 HOLES)
"A"
DRILL & TAP #5-40
① PLATE - STEEL - 2 REQ'D
5/16 DIA. SLIP FIT IN DET. #1, #2, #4
③ POST - DRILL ROD - 3 REQ'D
5/16 DIA. S.F. FOR DET. #3
(OR TO FIT DRILL PRESS TABLE)
② STRIP - STEEL - 1 REQ'D
5/16 DIA. REAM SLIP FIT FOR DET. #3
④ SPACER - STEEL - 3 REQ'D
KNURL
OPTIONAL SCREW
3/16 DIA.
#5-40 THD
1/16 DIA. P.F.
⑤ SCREW - BRASS - 4 REQ'D

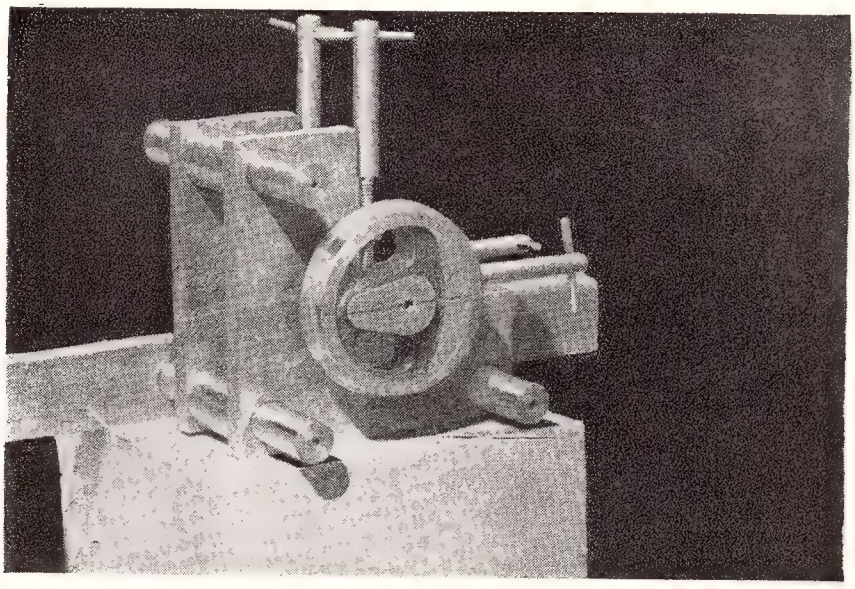
holes. Play develops by itself later on. In the case of the T-handle, 4 pieces of 1/16" drillrod will form the handle. While cutting these, cut off 9 more pieces somewhat longer than 1/2" to be used for pinning all parts together.

Now we have all our hardware and are ready to start the assembling. Push the bushings to about the center of the drillrod legs. With a depth micrometer, exact centering is obtained. A depth-gauge will probably have to do in most cases, but with a little patience and a lot of comparing, you will get them all alike. Pin the bushings to the legs at once, before they move. The pins should be a pressfit, obtained with a #54 drill followed with a 1/16" drill. This is known as reamdrilling. Peen the protruding ends flat. If you are after appearance, you may set this assembly up again in the lathe and take a light cut over the bushing only. The pins will hardly be visible then.

The legs are now inserted into the clamping plates and the entire assembly is held tightly by a clamp. Drill for one pair of pinholes at a time, again using the reamdrilling method. Pins are inserted immediately after drilling, before clamps are removed. Care should be taken not to get drillchips between plates and bushings. The pins are slightly flattened out with a hammer after they hit bottom. Thus, after you file them off, they will not be noticed. Insert the brass screws and you are ready to start quartering. Of course, you made sure that any one pair of drillrod legs fits freely into the indexing strip. If they don't, an expansion reamer should be used very carefully. There must not be any play.

The drivers are pressed onto their axles and fully machined before the quartering operation takes place. In order to prevent troubles later, make sure that: The wheels are a tight pressfit on their axles, preferably pinned, keyed or otherwise locked permanently; the right side driver's crankpinboss leads over the left side one by 90 degrees; and that you didn't forget to slide on the wormgear before pressing the drivers in place. Leave gear loose on axle as you may have to slide it over a bit. Pin after quartering is done.

Scribe a very faint centerline through all crankpin bosses. Don't be too fussy, by eye is close enough. Now, put all pairs of wheels on a piece of track or the workbench the same way you want them to go on your loco. With a pencil, mark all right hand wheels by the rim,

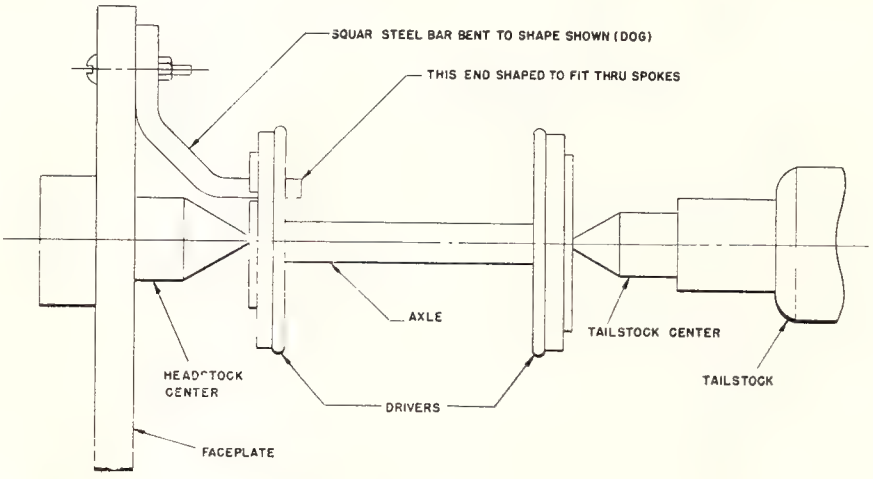


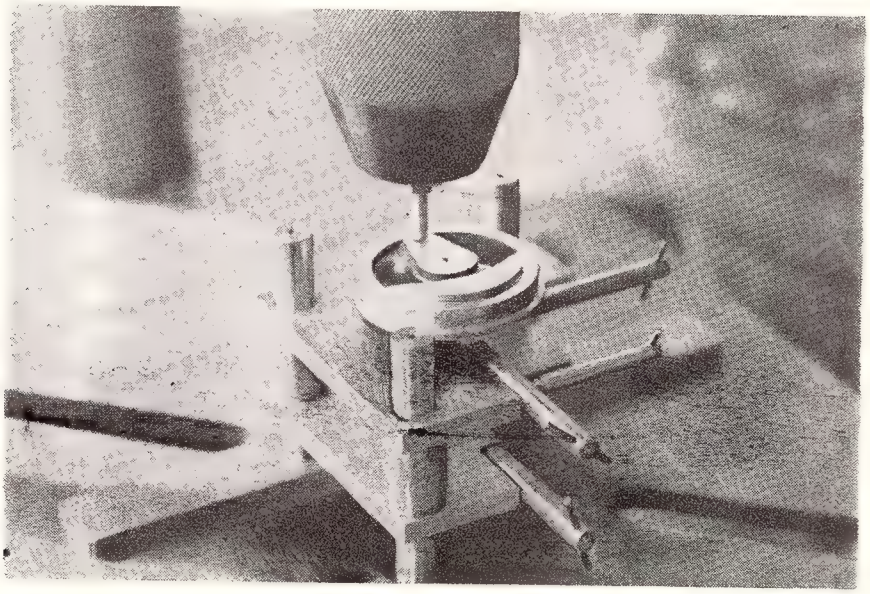
Jig, with wheel and indexing strip, on the drill press table ready for the spotting or locating.

adjacent to where you are going to drill the crankpin hole. A similar mark is put on the fixture, as shown in figure #1, called an *indexing mark*. The reason is obvious: all wheels will thus go into the fixture in the same way. Should there be an inaccuracy in the jig, it will not matter because it will appear always on the same side of the engine and binding later on is avoided.

The marking done, you lay out one crankpin center only, on the first right hand driver. Centerpunch carefully and place this pair into the jig, centerpunch mark and pencil mark to line up with indexing mark on fixture. Make the clampscrews up lightly on the axle and twist top wheel so as to bring the previously scribed centerline in parallel with the outside edge of the fixture. Turn unit over and compare for parallelity. If out too much, find the happy medium between the two lines and the two edges.

For the spotting that follows, use an A 1 centerdrill (body diameter ⅛"). Have it run as true as possible in your drill press chuck. Put the indexing strip across the table and place the fixture with the drivers centerpunchmark up into the strip with either pair of legs. Hold the fixture with your left hand lightly and let the drill find its center. Drill about 1/16" deep, shut off the motor and let the drill idle to a stop. Keep pressure on the drill all the time and finally lock your spindle movement. Thus, the jig is now clamped down by the drill and properly located. Attach a clamp carefully to each end of the indexing strip. Release spindle lock. Now you can breathe again and finish spotting the hole. Drill as deep as you wish or even through with the centerdrill. Don't push too hard, let the drill do the work. If the drivers slide down while drilling, they may also twist and your guarantee of perfect line-up is gone. Sometimes on larger wheels, I place small strips of shimstock between the wheels and the clamping plates to arrest all vertical movement.





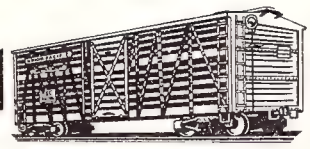
Right hand wheel properly lined up in the fixture. The centerline has been penciled on so as not to scratch the finished wheel. This line, barely visible, should be close to parallel (by eye) with the side of the fixture.

The fixture is now lifted out of the strip, turned over and twisted 90 degrees and re-entered, with the opposite wheel facing up. Start the drill easily and let it find its own center. This procedure is now repeated on as many pairs of drivers as your locomotive has. Centerpunching on any of the following sets is not required as your drillpress is all set up now. You can quarter a hundred drivers this way and the last one will be equal to the first. Of course, it all depends on your workmanship and the condition and accuracy of your drillpress and chuck.

Actually, the fixture has now served its purpose and should be stored away until the next engine. I prefer to drill and ream the crankpin holes, once they have been spotted, on a pair of parallels supported by blocks.

Although this fixture was designed for O gauge use only, it may be adopted for other gauges as well. The first one I built was about twice the size.

Any questions that remain to the model railroad builder will be answered promptly if addressed care of THE CRAFTSMAN.



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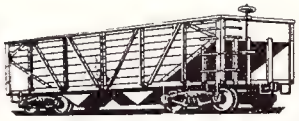

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Picking the Varney Contest winners—So many entries poured in from all over the country that the judges had to make their selection in the big stock room of the Varney plant in Chicago. Here Gordon Varney is receiving the judges' selection for the grand prize; from left to right, judges are Al Kalmbach, Larry Sagle and Ed Ravenscroft. This contest is believed to be the largest of its kind in the history of the hobby. Contestants were asked to finish the sentence, "I prefer Varney HO kits because . . ." and the response from all over the world was gratifying. It made the job of the judges particularly tough but they managed to agree unanimously on the prize winners. Winners will receive their prizes through Varney dealers.

4-4-4 LIVE STEAM LOCO

(Continued from page 25)

The pedestals should be cut out allowing about 1/32" for filing finish to line. In filing out the pedestals, get the edges square with surface, test with a small square frequently as filing proceeds, the vertical face must also be square with the bottom edge of bar. A ten inch rough flat file will remove most of the metal, but leave a little for finishing with a ten inch, or smaller, "smooth" file down to line. Finally "draw file" the face to produce a nice smooth finish. To "draw file," grasp the handle end in the left hand and the point end in the right and push the file back and forth along the edges being worked.

After one edge of one pedestal is finished, proceed to work on the mating face in the same manner, and instead of finishing this to line marked, file until a piece of 3/4" square cold drawn steel will just slide up and down without sticking, yet without being "sloppy." By the way, all cold drawn or cold finished steels are accurate to dimension within two or three thousandths of an inch, often right on dimension. Having one pedestal opening completely finished, go to work on the forward face of the rear pedestal, finish to line and as a further check, set a pair of outside calipers to 3 1/4" as close as can be measured by the rule and "feel" with the calipers over the two faces, up and down. Finish out the other face as before using the 3/4" gauge block.

LOW COST MOTIVE POWER for an HO Railroad

By WILLIAM SCHOPP

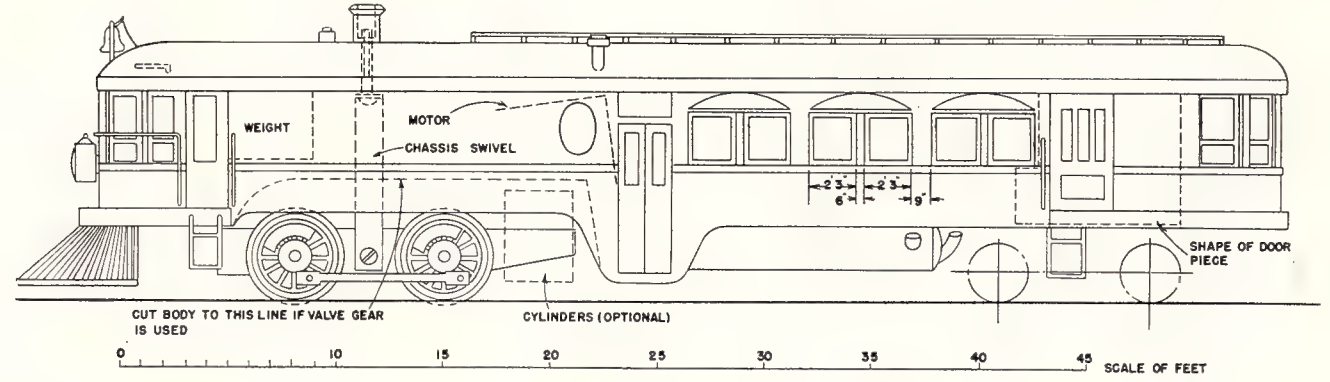
WITH a little work, a very low cost piece of motive power can be made for your HO railroad by utilizing parts from the lowest priced kit on the market today, the Varney Dockside Switcher. The accompanying list of parts is not 100% complete since bristol board sides, celluloid, paint and cement are not included, nor are couplers, tanks, stack, steps, etc., which will be explained later. There are a few screws necessary to mount the motor, the keeper plate and to attach the chassis swivel bracket but these should not run over a quarter altogether. The price can be kept within $10.00 by making your own bell and headlight and utilizing salvaged equipment.

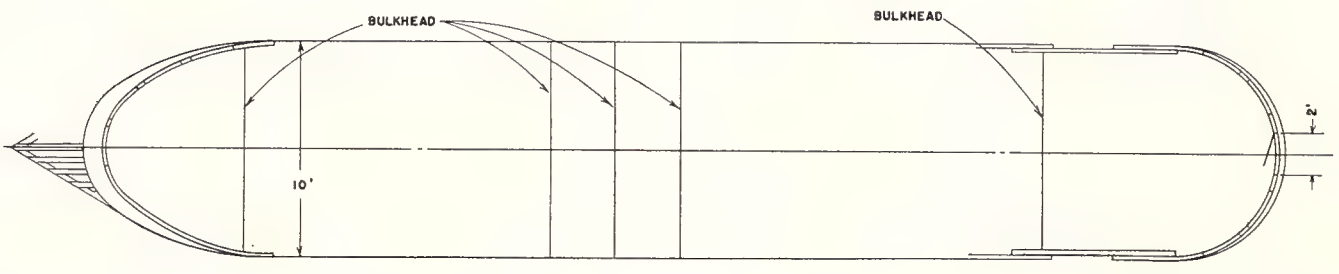
A little explanation of this *locomotive* might be in order. It is not a trolley, nor a gas car . . . it is a *steam motor car.* What, you never saw a steam motor car? I never did either but I have seen photos of them and read accounts of them in old railway magazines. In the first decade of this century, a steam motor car was considered to be the answer to the fearsome trolley competition on short hauls. It was not enough saving over the use of a separate steam locomotive to meet the later competition of gasoline motor cars such as the famous needlenosed McKeen motor car.

If I had to pick another era of history in which to live, I believe from a rail standpoint, I would pick the ten years before World War I. Trolleys are particularly in my mind, but the efforts of the steam roads to meet electric competition were also interesting to judge from the contemporary literature of the times. It was around 1910 when the Riverside, Bridgeboro and Mount Holly Railroad bought this steam motor car in an effort to stave off receivership. When the road was electrified in 1913 and extended to Atlantic City, the car was used for emergency service. In 1917 it was placed in service on the Camp Dix branch which connected with the Smithville-Trenton branch (N. J.). When service on the branch was discontinued after the end of the war, the steam car was again relegated to emergency service. Upon abandonment of the electric line in 1945, the steam motor car again was called into service to provide freight and passenger service on the short stretch of line remaining between Atlantic City and Brigantine. At one time, this car sported a trolley pole to work signal contactors on the wire but this has since been removed.

The heart of this HO model steam motor car is the motor unit, based on the mechanism of the Varney Dockside Switcher. I will first describe how the "mech" be assembled and later tell how I did it (at more expense). First of all, the frame must be cut off. At the front end, the cut should be just in front of the stud on the bottom which helps position the keeper plate. At the rear the cut should be beyond the sloping stud on top which supports the back of the motor.

Before the wheels are used there is a little doctoring job we should do on the counterweights which are crescent shaped, not as shown in the plan which is more in line with the customs of the period. Actually, I think my counterweights are a little heavy, but make them to cover the crescent shaped ones. My counterweights are made of one doughnut shaped ring of flat metal. I used the lid of a man's wrist watch mainspring barrel, but a suitable sized washer could also be cut into quarters. The new weights are cemented in place. Next, the wheels are set in their grooves and the keeper plate screwed on. Then the motor is mounted as usual for the Dockside and the unit may be tried out. If the performance of





the front wheels is satisfactory, screw the side rods in place. The reason all four side rod screws are specified as *short* is that the long ones normally used on the rear drivers are to take the main rod to the crosshead in addition to the side rod. The model I am suggesting you build has inside cylinders connected to a crank on one axle.

The chassis pivots to the body by means of a long U shaped piece of strip brass marked on the plan as chassis swivel. It must clear the top of the motor. One end is screwed to the hole normally used for the two-rail pickup shoe on the frame between the drivers. The other end is affixed by a screw to a similar hole drilled and tapped 2-56 on the other side. A long 2-56 screw is run up from the bottom through a hole in the top of this shaped chassis swivel and a nut is run down to keep it from dropping even part way out. The nut, however, is not tightened up but is left just loose enough to allow the motor truck to swivel freely, with a minimum of wobbling. A spot of solder on top keeps the nut in place. The long 2-56 screw is run through a hole in the roof and anchored at the top with another 2-56 nut which is not soldered since you may want to take out the motor truck for various purposes. The nut may be concealed by a piece of tubing for the stack, or the stack itself may have a 2-56 hole tapped in the bottom and act as a nut.

My model was complete with cylinders and valve gear, but to keep the price down, these parts could be omitted. The cylinder block, cross-head guides and valve gear kit runs well over $6.00. Besides, the cylinders are certainly too large for a self propelled rail car, even if it is expected to pull a trailer or two.

To mount the cylinders in the normal position in front of the drivers, where Varney meant them to be, I would have had to raise the engineer's cab up considerably, doubtless above the level of the rest of the roof. I mounted my cylinders behind the drivers which necessitated some alterations. First of all, I measured up the stud on top of the frame, which is meant to support the motor. Then I cut off this stud and filed the cylinder saddle to the same slope so it could support the motor the same way. A piece of brass rod was driven into the hole in the cylinder block, then drilled and tapped 2-56. This, with a washer underneath the frame, provides the means of holding the cylinders. Then I inserted the cross-head guides and more or less followed the directions for installing the Central Valley Dockside valve gear. However, I did eliminate the material they have to fit under the Dockside boiler. Instead I soldered the valve yoke to the cross-head guide ends and got a little better support. My hole in the valve chest was a little sloppy for the valve rod so a short length of brass tubing was affixed with cement.

The Central Valley valve gear is a little tricky to assemble with the rivets provided. For this Motor Car I finally

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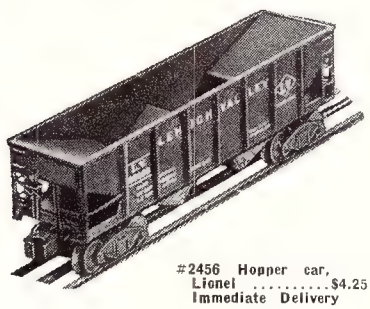

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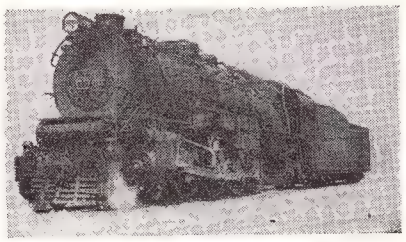

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returned to the way I made my first loco valve gear back in 1937. To make a joint in valve gear, stick a pin through from the back. Next comes a piece of paper, then the front rod and a dab of soldering paste. A hot iron solders the pin to the front rod and the paper, when pulled out, provides clearance. The excess pin is snipped off, then filed flush. A spot of oil helps freedom of motion.

The body of the steam car is a pretty much free-lance proposition. I wonder how a steam motor truck would look on a modified old time coach (such as manufactured by Mantua or Red Ball), perhaps with the front platform enclosed for the engineer?

First, make up your mind what type car body you want. Will it have to be cut up high to clear valve gear? Perhaps you want to move the door farther front or move the cab a little further back? Or add extra sets of windows and eliminate the express compartment? The place to begin an odd shaped body like this is with the roof. My shape was pretty much determined for me since I dug around and found the roof for my old McKeen motor car. This had a rectangular hole cut in the front to clear the motor truck but this is not necessary on the steam car although a little gouging of the underside may be needed depending on the roofing you use.

I made my car body in the usual two sides and two ends manner from filing folder stock—after this experimenting, I believe the method used on my McKeen motor car, with modifications, would be much preferable. One "side" consists of the engineer's cab in front and includes both sides down to the baggage door. The other "side" is the back cab front to the baggage door. Both of these are laid out symmetrically around center lines. I suggest using a strip of paper to get their correct lengths, then allow a few scale inches extra. Any *slop* one way or the other may be taken up by changing the length of the baggage door.

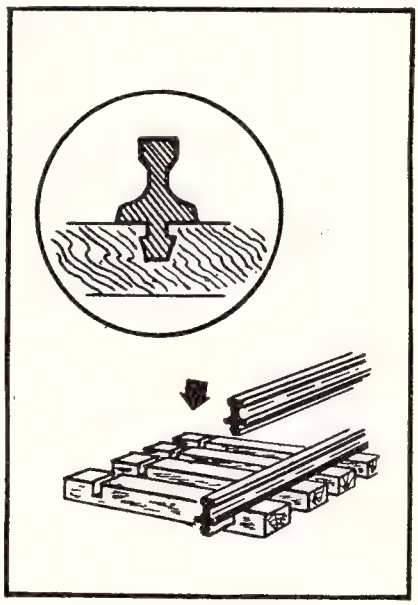
Each part is then laid out accurately on a drawing board using T square, triangle and a pair of dividers to get symmetrical spacing. The main part of each side is, of course, obvious. Positions of letterboard, belt rail, etc., should be marked. Holes for grabirons should be pricked with a pin held in a pinvise. The inner layer of the sides includes the window frames and doors and may be made by tracing through the openings cut in the main side. The curves of the ends should be bent to approximate shape before any windows are cut out, then flattened as little as possible for the actual cutting. They should again be bent close to shape before the sash layer of the ends are cemented in place. The underpart of the roof, or *soffit* as it is called, should be shaped correctly. Pieces of bristol board shaped the same as the soffit can be cemented in at the bottoms to form a floor and keep the bottoms in shape.

The remainder of the sides can now be cemented to the soffit. Finally, the baggage door is cemented in. Both soffit and later the floor will have to be notched slightly to accommodate the extra thickness here. So now you should have a roof with sides and ends attached.

Here is a good chance to paint the window sash and avoid getting paint on the "glass" as you will if you wait till the car is finished. Paint the sash and let it dry. It doesn't matter if some paint slops over on the sides since they will be painted later. I like to paint doors the same color as the sash.

When this paint is almost dry, you may cement the celluloid glass in place. When this has set you may finish making the holes for the grab-irons which in some cases will also go through the celluloid. Use a pin in a pin-vise with gentle pressure and rotating motion, backing up cautiously with the fingers or a piece of cork. Then the bulkheads should be put in place to stiffen the body. Be sure they are short enough to allow for the thickness of the floor. You probably won't be able to put the bulkhead in front of the toilet rooms since the motor will take up that space. The others may be arranged with doors and windows placed as you wish. The toilet room oval windows may be shown partly opened. They usually swivel on a horizontal axis as shown by the dashed lines, the bottom opened out, the top in.

You might also install the weight in front which helps balance the motor overhang—in the Dockside, this is done with cylinders, pilot beam and boiler. This weight should be as wide as the car but



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must not infringe on the motor, the chassis swivel or the worm gear in any of their turned positions. You may cement it in place, but a screw up through a hole in the weight into the roof is better.

Next comes the floors. The front floor includes the bumper, which is later covered with a strip of paper. The rear floor runs from the steps back but the back bumper is just a strip of bristol board or filing folder placed outside the car end and running from the front of the baggage door around to the same place on the other side. The back floor may be drilled to take the trailing truck king-pin screw.

A word as to the trailing truck. I used an old Walthers truck but a more fragile looking passenger truck such as Mantua's or Red-Ball's interurban truck would be better. Also, if at all possible, the wheels should be spoked. These will show up nicely IF the truck frame is not too obscuring. Now you tell me where to get spoked wheels in HO in sizes 36" or smaller? I used to have an HO motor truck, with trailer, made up with spoked wheels of British manufacture, but sold it when my electric line was abandoned. The only other spoked wheel motor truck was made at the same time as mine by George Stock.

The one motor lead that usually runs to the two-rail pick-up is connected via underfloor wiring to the rear truck. The other brush of the motor is grounded to the frame by the manufacturer.

The belt rail and lettterboard of filing folder stock should be cemented in place at this time. The belt rail may be all one piece with the joint over the train door in back where it may be covered by a small backing up light. Handrails may now be bent from wire and thrust into the holes meant for them. The front railing is bent up on the job bit by bit as it is soldered to the brackets—bits of wire protruding from holes in the window posts.

I would mount the car on both trucks now and give it a trial run if this has not been done before. When this is finished, other detail may be added. The roof has a bell and bracket from Mantua's Belle of the Eighties, and a whistle bent from a piece of brass wire. The stack is a piece of tubing and the safety valve another bit of brass wire. The toilet vents may be wire or special turnings. The roofwalk is bristol board, scribed to represent planking and with bristol battens cemented to the underside. Of course, a passenger car does not need a roof walk but it adds detail. I have not shown ventilators on the roof, but I bought a set of Varney's plastic passenger car fittings and used them. These could be simulated from thin pieces sawed from a quarter inch dowel. Perhaps you'd like to install piping for the Pintsch gas lighting system (since removed) or conduits for the electric wires on the roof. I have installed ladders to the roof on my model.

Body detail includes a big Belle of

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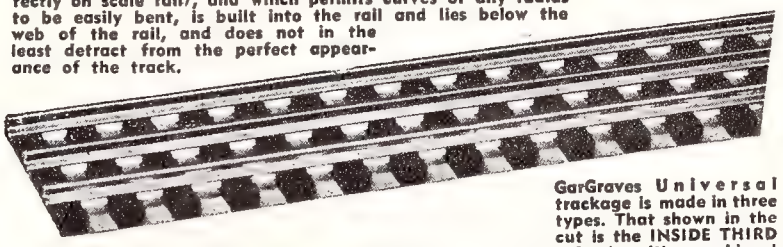

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the Eighties headlight painted black, marker lights if desired and stirrups to the cab and baggage doors. The stirrups may be bent up from flattened paper clip wire with steps soldered in, or may be cut from standard ladder stock. Fuel and water for the steam car are carried in three long tanks under the car, only two of which can be seen. Additional items such as air pump, air tank, generator, etc., may be considered to be inside the body in the boiler section over the drivers, although a nice cluttered appearance could be had by mounting this junk on the roof.

Your favorite couplers may be mounted in place. As shown, a regular front coupler is impossible with that big interurban pilot. I suggest making this of 3/16" square brass, soldering it together. The upper ends of the rungs can be soldered to a metal plate spiked to the underside of the floor or made from small square lengths of wood.

As you can see from the photo, my car is equipped with eye-brow type pilot similar to the Indiana Railroad interurbans—this permits a front coupler. It is spot welded up from scraps of nichrome wire, the resistance wire used in electrical appliances.

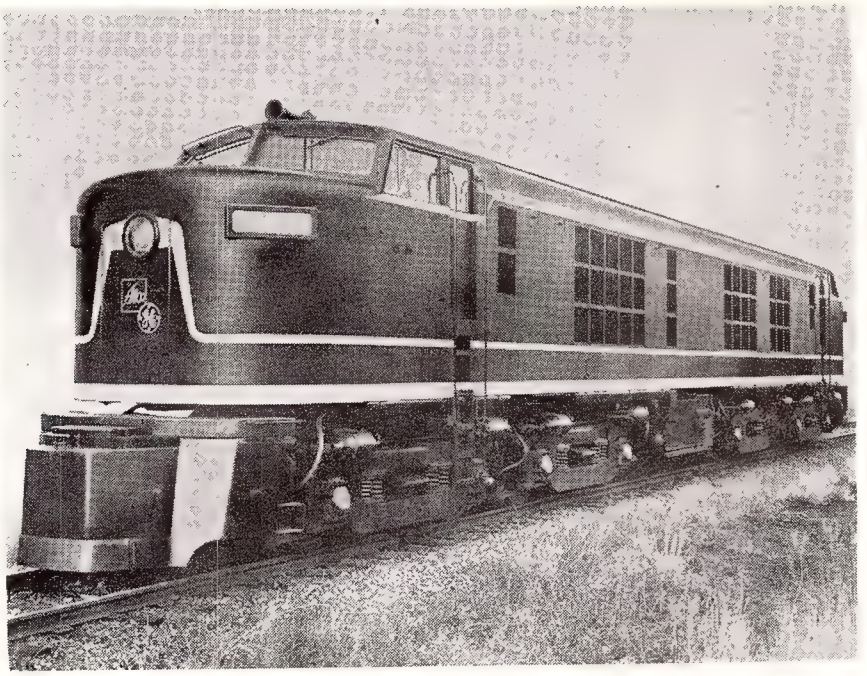
For painting, I suggest using tube color ground in oil, thinned slightly with turpentine with japan drier added. Mix this up and paint with a small brush. The color scheme on my model has window frames, doors, letterboard and belt rail of vermillion, the rest of the body is tuscan red. Roof and underbody are black. I put on striping with yellow oil paint mixed as above, flowed from a ruling pen. The belt rail was striped, another just above it and another below the letterboard. I do lettering with the same paint or with opaque water colors, using a crow-quill pen. Finally, a coat of varnish is applied which will preserve any water color lettering and give the entire body a slight gloss.

ALONG THE TINPLATE TRACK

(*Continued from page 28*)

brake trips were manufactured, one series with ordinary type switch stands and the other with the more elaborate patented type.

In their line of accessories, there are several obvious parallels with that of Ives, as the pages reproduced from the 1907 catalog reveal. The bridges are very similar, but not identical with those of Ives. In at least one instance the numbers (the No. 100) are identical. The bridge called by the AMR Co. their No. 102 corresponds to the Ives No. 101. Throughout the line, the numbers seem to be close enough to Ives to have necessarily been confusing to toy buyers who were ordering both lines or switching over from one to another. It would seem that the system of numbering—some numbers like the 0, 11 and 17 locos identical, others like the bridges almost identical, and still others totally different—hardly seems to have been calculated with any particular purpose or plan in mind. It



The first gas turbine-electric locomotive to be built and operated in the United States, shown in preliminary track tests at Erie, Pa. The potentialities of this new type of motive power are now being tested by the builders, the American Locomotive and General Electric Companies.

may be assumed that it was felt that "0," "11," etc., were the proper standard designations for those size locomotives. What other factors entered into the numbering are difficult even to suggest at this date. It is perhaps sufficient that after more than a decade of working toward that end, we are at last able to fill a long-felt gap in tinplate data by furnishing a full list of their locomotives and cars.

There still remains more to be said about the accessories. The AMR Co. turntables, with their single entry track, and three grouped round-house tracks at the other end seem to us much the most realistic and satisfactory of tinplate turntables. The telegraph post with the cable reel is an interesting and unique accessory, if more in the nature of an oddity than anything else. No doubt the boys of the day had a lot of fun with it.

A word concerning the stations is in order. The No. 120 station shown on the catalog spread reproduction is obviously a German production. It was quickly dropped. The American Miniature Railway Co.'s No. 121 station, introduced in 1908, is about as close a copy of the Ives No. 113 station of the day as it would be possible to imagine. The only ready point of distinction is that the Ives station carries a sign, "Telegraph Office," over the window while the AMR Co. product is lettered "Ticket Office."

If we may be permitted to generalize, we believe it might justly be said that in the first year or two of their existence, the American Miniature Railway Co. very closely copied Ives, but after that their designs show a considerable degree of originality. Naturally, as the same men were, in 1907, 1908, etc., designing the AMR Co. equipment who, prior to that earlier date had designed the Ives, there is considerable similarity of technique and detail. There may, however, be a tendency to overemphasize this point, knowing, as we do, that the same individuals designed much of the equipment. After all, the early American Flyer models were also copied from the Ives and show many traces of similarity.

ELECTRIC TROLLEY LOCO

(*Continued from page 14*)

In the case of the upper frames (Item F) a simple jig can be made by driving four No. 20 wire brads into a board spaced at the corners of the frame layout. These brads will then serve as posts about which the corner loops are bent. After forming the loops they can be twisted 90 degrees into the final shape.

Another simple jig will assist in forming the lower frames, Item M. Set out two brads as posts about which the inverted U shape is made. Carry the wire ends straight back more than double the frame length. Now place a ⅛" dia. rod across these ends in the location equivalent to the shaft in the final product. Pick up the wire ends, carry them over the rod, then cut to length and solder them just below the posts to form the loops desired. The rod can now be withdrawn and replaced with short lengths of ⅛" OD, 1/16" ID tubing that should be soldered firmly in the loops. Assemble the upper frames to the lower frames by opening the upper frame loops then squeezing them closed over the crossbars. It should be noted that the upper frame diagonal braces slant in opposite directions so that when viewed from one end of the locomotive they appear to cross each other. Now position the frame sets within the base and install the shafts, including the equalizer cranks. Solder the lower frame loops to the shafts but do not anchor the cranks at this time. Connect the top frames with a length of

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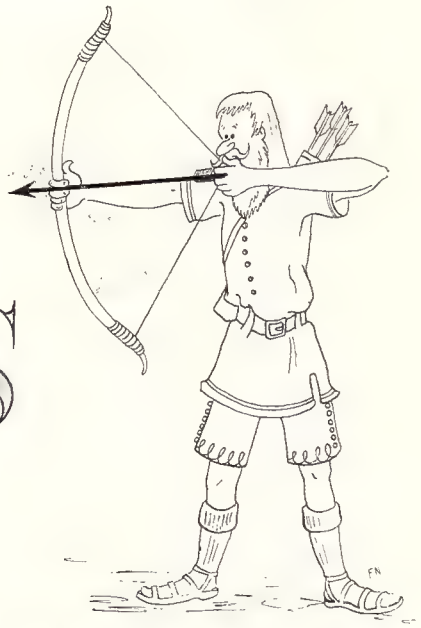

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1/32" dia. wire inserted through the top loops to act as a top shaft. Squeeze the upper ends of one top frame together slightly to fit between the loops of the other top frame.

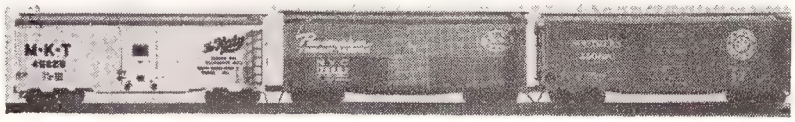
A contact shoe is made from two lengths of 1/32" dia. wire to the shape specified in the views under Item F. Space the ends 3/16" apart, curl the ends downward with a 1/4" radius and solder together in V shaped horns. This contact shoe is in turn soldered to short sections of 1/16" x 1/16" angle bent from tin can stock. A No. 65 hole in each angle piece permits them to be slipped on the top shaft, after which the shoe can be mounted on the angles. These angles, therefore, serve two purposes, namely, to swivel the shoe and to contain the top frame loops along the shaft. Lock the whole assembly in place by soldering one angle fast to the top shaft.

Our model makes use of the cross connected equalization scheme as employed in real practice, but combines the two equalizer rods into one assembly for the sake of simplicity. A cutaway sketch shows this connection. Notice on the top base view that the equalizer assembly is offset to avoid interference with the hook mechanism. To establish the correct equalizer setting, place the pantograph base on a level board and raise the shoe to approximately half operating height, taking care that the lower frames are raised equally, not lopsided.

Now holding the shoe in this position with a steady hand or sky hook, solder the crank fast to one shaft so that it is in a straight up and down or vertical position. The connecting rods are lengths of 1/32" dia. wire having right angle projections on each end and bent to pass under the base plate as shown. The effective length of these rods, measured between the projections, must be exactly the distance between the shafts, or in this case, 1". Note that the rods extend from the top hole of one crank to the lower hole of the other crank and therefore crisscross. The end projections of the rods pass through the crank holes, then are bent forward as shown to lock the rods in place. With the rods secured, raise the shoe to full wire height, then solder the loose crank fast to its shaft. Now check the pantograph appearance at various heights. If all parts were properly made it will rise and fall evenly, but should it be lopsided, unsolder one crank and reset for correct action. A single coil spring, wound from No. 29 wire to 1/16" dia. is stretched between the two cranks above the base plate. Form loops at the spring ends and hook them over the connecting rod projections. Proper spring tension has been set by NMRA so that the pantograph will just balance the weight of a half dollar at wire height.

Installation of the lock down hook will complete the pantograph. A length of 1/16" OD, 1/32" ID tubing is soldered along the bottom side of the base plate, extending from the slot to the outer side frame. It will be necessary to file a groove in the lower edges of the side frames so that the tube can be brought straight out. Before soldering the tube, insert a piece of 1/32" dia. wire, one end

SWEETHEARTS ON PARADE



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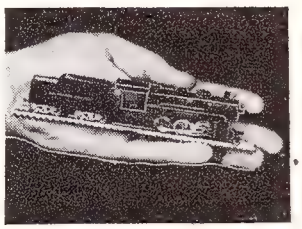

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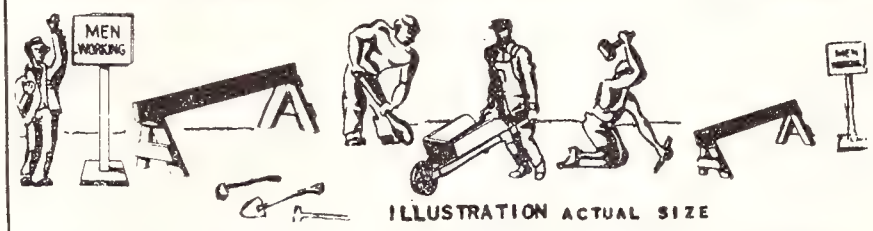

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of which is bent up in hook shape while the other end is bent around to form the operating lever. The hook engages the top shaft and should hold the shoe as low as possible without causing the lower frames to short on the sub base cross "planks."

It may seem strange to classify truck side frames as accessories since they are vital on real locomotives, but on our model they are dummies that merely go along for the ride. Item N presents side and exploded views of the side frame that clearly shows the location of all parts and the assembly method. Start construction by cutting the top sills (Item O) from 1/8" x 1/16" brass strip. Then bend up four pedestals per Item P taking care to drill the No. 65 holes at a uniform distance from the top edge. Now solder the pedestals to the top sill in their proper location with a gap of 3/16" between pairs to receive the journal boxes. Next bend up the angle braces (Item S) and the connecting bar (Item P). Position these parts with No. 20 wire brads used as bolts, then solder all parts together.

Item U specifies the journal boxes that are hacked out of solid 1/4" square brass stock and drilled centrally to accommodate the axle journals. These boxes are sketched in simple outline but can be further embellished with rounded contours and hinged lids if desired. Place the boxes within the pedestals so that the axle holes are centered 1/4" below the upper edge of the top sill, then solder fast on the back side. The equalizer bar, detailed in Item R, is cut from 1/32" brass sheet. You will save time by sweating four strips together, thus sawing out four bars from one trace. Install the bar so that it rests on the journal boxes, tacking it in place with solder on the back side. Item Q shows the dummy leaf spring that is cut from 1/32" brass sheet. This piece is centrally located between the pedestals and rests against the back side of the equalizer bar to which it is soldered. A short length of 1/8" wide tinplate is shown at the center of the spring extending between the bar and the top sill. Tack this in place to represent the clamp used in real practice that binds the spring leaves together. When the four frames are completed, install them on the motor trucks, using pieces of spring wire soldered across the frame ends to hold them in place.

Make the pilots from 1/32" brass wire, first shaping the outer frame from a continuous length of wire to the outline shown in item W, then soldering in the upper cross member and sloping bars. If the pilot outline is traced on a flat board, equal divisions for the 15 inserted bars can be marked off along the trace. Then thumbtack the skeleton pilot frame on its trace and use the marks established as a guide when soldering the bars in place. The pilots are installed on the chassis by soldering the lugs provided on the frames to the underside of the decks. Angular braces are then added. Solder these to the inner edges of the side sills. Take the exact location of the pilots directly from the locomotive side and end views.

An air whistle, as outlined in Item X, is made by soldering a length of 1/8" tubing on a piece of 1/16" rod. This rod passes down through a hole in the roof right along one side of the center roof brace to which it can be soldered. Determine the location of the whistle from the engine views.

A locomotive bell completes the roof top detail. This bell is a commercial item, obtainable from hobby stores, and features an air cylinder ringing device in detail, no less. Locate the bell along the roof center line at a distance 3/8" in from the edge on the pantograph end. The bell is held in place by a flat head 0-80 screw countersunk in the under side of the roof overhang.

The Inland Empire locomotives carried both headlights and MU jumper sockets under the roof projections, above the end doors. This suggested the possibility of combining dummy headlights with working jumper sockets and the Long Valley engines were so fitted. For this purpose, small radio phone tip jacks were selected that had black bakelite caps resembling headlight shells in size. The jack ends were countersunk with a 5/16" drill, then polished to create the appearance of conical reflectors. Installation of these jacks will require 5/16" mounting holes in the cab ends at the points previously spotted for this purpose. In the event that you do not want jumper sockets, a pair of headlights can be turned from brass rod and fastened to the cab ends with 2-56 screws.

Two wiring circuits are presented for this locomotive. Since the reverse switch is grounded to the frame by nature of its installation, it will be necessary to bring out two brush and two field leads from each motor. Circuit A shows the parallel motor connections for hand reverse alone, while Circuit B adds the bridge rectifier for use with remote polarized reverse. When cabling the motors, take notice of the method shown in the chassis photos. On K & D motors, there is an unused hole in each field pole that will accommodate two wires. Carry the brush leads down one hole and the field leads down the other. The four leads are then tied into a cable that passes over the trucks as shown. On the roof top, a jumper connects the pole base with the pantograph. A lead through the roof taps into this jumper, then is carried down one cab side, passes under the lead block in the passage way provided to connect with the switchgear. If jumper sockets are used, another wire strung along under the roof connects them with the power lead. Third rail shoe wires can, of course, follow the motor cables over the truck tops.

With all locomotive parts completed, final assembly can be made. After installing the roof detail, turn the body upside down, insert and fasten the ballast block in place. Now solder the trolley lead to the switchgear, then fasten the motor trucks and switchgear plate on the frame sills.

You will find this locomotive especially handy for servicing since all the working parts are easily removable from the bottom without disturbing body details.

SAFETY VALVE

(*Continued from page 7*)

struggle for the next one and yet both may be skilled craftsmen. I have seen cars built from kits and from scratch by modellers who turned out a beautifully detailed and excellently assembled model but give them a loco kit or a car kit of metal and they are stumped. Someone else will do a magnificient job in metal and really louse up a car not made of metal parts. Each to his own skill.

After all the beauty of model railroading as a hobby is the breadth of scope covered in interests and skills and anyone, regardless of his skill, intelligence, and interests can find some phase of our hobby to enjoy. If our confessor is a putterer and never gets any farther than he had at the end of the article, he must have had fun for he still confessed to be a dyed-in-the-wool model rail.

Frankly, I feel there is definitely a place for such an article in any model magazine. Whether we like it or not, there are people who feel they must have instant success in anything they tackle or they will become discouraged and shy clear of attempting something in the same field again. That's their nature. How encouraging it must be to such as these to read the criticized article and see that they are not the only ones who find the going tough. It must be discouraging to see the fine models of others and feel that they are the only misfit. Go easy on the "Confessor" and his kind, with the proper encouragement, they too will become "model" model railroaders.

You have met the people at Mantua; can't you concede that they are human enough to read the "offending article" and get a good laugh out of it, as did my husband and I, and not come off with a feeling of being sabotaged? The people who have successfully assembled Mantua kits and laud them are far, far greater in number than those like our "confessor."

Keep up the good work on the Craftsman. We were very glad to see it become "100% model railroading." . . . Mrs. Robert Mares, Pittsburgh 12, Pa.

* * *

Please enter my subscription to M. C. for one year, d - - n near missed your second article on building an S. P. switcher due to the magazine being sold out in the hobby shops.

Now that I've paid my admission so to speak, let me into this discussion about this alleged "non-constructive article." *Confessions of a Model Rail.* Come, come Mr. Penn, let us rid ourselves once and for all of this delusion that manufacturers are deities and incapable of imperfection or that they are exempt from criticism. I personally felt that Mr. Waterbury's article was in a humorous vein and not to be taken too seriously, even though there were a few items he mentioned which could well be taken to heart by certain manufacturers.

Mr. Waterbury probably felt somewhat as I did when I built my first locomotive kit. I rushed down to a hobby shop and plunked down twenty nine and a half skins for a kit, possibly of the same manufacture as the one which Mr. Waterbury described, and rushed home with it, envisioning a set of matched precision parts which would go together as advertised.

To make a long story short, I had the same trouble Mr. Waterbury did. The two halves of the cab did not fit the curvature of the boiler, one running board was warped and twisted like a corkscrew, the crosshead guides must have been four pieces of metal left over from some trimming operation and the yoke casting was defective. My surprise was complete when I saw how the electrical contact between loco and tender was accomplished.

I believe Mr. Waterbury's point was, as mine is, that if the bug bites you even such a discouraging beginning cannot overcome the desire to get a layout in operation.

I suppose that, judging from your remarks anent Mr. Waterbury, you have decided that he is incapable of using such rudimentary tools as a screwdriver and a pair of pliers. Again, let's be fair about it. Hobby shops are full of such items as pin vises, jewelers screwdrivers, magnifying eyeglasses, optical screw taps and dies, etc. Why? Simply because they are needed if a creditable job of construction is to be done in HO. The layman naturally expects that when he pays from thirty to sixty dollars for a locomotive kit he is going to get some finished and precision parts for his dough. It only takes one kit to convince him that he is paying for something else other than good workmanship. What that something else is, I've never found out. There is more precision workmanship in a twenty dollar model airplane engine than in any fifty dollar HO loco kit that I've seen on the market.

Personally, I think articles like Mr. Waterbury's are good for the hobby. If no one ever puts in a gripe about some of the junk on the market we'll never get any improvements in design.

Would like to know what some of you other model rails think about this subject. . . . R. C. White, Inglewood, Calif.

* * *

I want to add my protest to yours on the article by Mr. Waterbury. I am sincerely glad that this sort of thing doesn't come often in your otherwise fine magazine.

I would have written you sooner, but I have been in the hospital for the last six weeks and haven't been able to do much of anything. BUT even hospitalized I was able to assemble one of Mantua's new Hopper cars. I want to add that I think Mr. Waterbury was all wet because I have assembled over two hundred cars of various makes in the last eighteen months and I have been confined to bed all that time. I have also built about thirty locos for other

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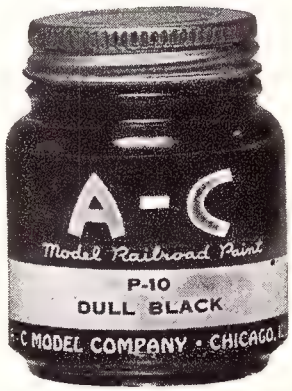

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The issues published during 1947 were memorable ones. They were full of constructive material covering all gauges and all phases of the model railroading hobby. It's impossible to give a complete index in so limited a space, but all the familiar writers were there. To name a few, Austin, Crater, Schopp, Long Valley Electric Ry, Barkley, Hertz and Bartholomew.

Many intricate phases of model railroading were described in detail. Besides the regular departments, there's an interesting lathe series, the workings of electricity as applied to model railroading, prototype plans of locomotives and cars and many construction articles on locomotives, freight and passenger cars, right-of-way equipment, trolleys and layouts.

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brass hats, and I haven't had a bit of trouble.

In all fairness I should say that to do anything you must have a will to do that thing. You have to start out in the right frame of mind. I will gladly give Mr. Waterbury lessons on how to use eight fingers for something besides thumbs! . . . Norman C. Sterzenbach Jr., Louisville 8, Ky.

* * *

Now that the important business is out of the way, will you please tell Editor Penn that he should have heard me applaud his article "Hot Under the Collar" in the October issue. Also you might send Mr. Waterbury a suggestion that he might save himself a lot of trouble by purchasing the book, "How to Build a Model Railroad" by H. V. Loose. More power to you and the magazine you publish. . . . Clyde L. Adams. N. Kansas City, Mo.

HIGH BRIDGE BRANCH

(*Continued from page 11*)

other three signal levers. After the train had moved completely over the crossing, the signal lever would be moved back, then the door lock lever restored and the door locked from outside by the switch lock. Today these signals are normally clear for the Central of New Jersey and may be accepted as such only after the train has come to a stop.

The bridges on this branch line have been strengthened or replaced from time to time to accommodate heavier power. All are supported by stone masonry piers and abutments. Nearly all are of steel construction although some of the old iron lattice girders are still in use. Two and one-half miles from High Bridge there is a modern steel deck span structure which carries the branch across the gorge of the South Branch of the Raritan River. This is at the lower end of the half mile long gorge and for that half mile northeast geographically or west by time-table the right of way is cut out of the rocky wall high above the stream. From the upper end, the branch follows the broad valley, through farm country and small country villages. The river is again crossed at Middle Valley on a bridge of steel deck spans.

The Chester Branch crosses the river at Long Valley about half a mile from the junction on an iron bridge. This is sufficiently heavy, as the High Bridge drill is the only engine which goes to Chester. All other bridges are less picturesque and similar to the latter two. Overhead crossings are of special interest. Thomas Street (High Bridge) was carried over the branch on a timber truss bridge of which each of the truss girders were sheathed and capped. The sheathing was made up of square edged boards, set vertically with the cracks covered by ogee moulding just as the ancient passenger cars were.

There is a modern concrete highway bridge at Dover which crosses the Rockaway River and the D. L. & W. Main Line as well as the branch. A timber truss carries a road over the W. & N. at Green Lake. Probably the most interesting of all is the culvert which carries the D. L. & W. main line over the Ogden Mine Branch between Lake Junction and Morris County Junction. The Lackawanna here is double track although it was formerly four tracked. The elimination of tracks 3 and 4 was an economy move when a reduction in service rendered them no longer necessary. This culvert could well be modeled as a culvert or as a tunnel.

It is interesting to recall that at nearby Ledgewood there was a stone arch bridge which carried the old Morris Canal over the road which has since become N. J. Highway 6. Another interesting bridge was in Dover. This was a lift span of timber which carried the branch over the canal. It had to be raised only a few feet, by a windlass arrangement, to permit canal boats to pass. Sorry, we have not been able to find a picture of this one.

At Hopatcong Junction there is a notable old wooden water tank which is kept full by an automatic electric pump. It is at a point where the Ogden Mine Branch crossed the old canal on an iron bridge at the foot of one of the once famous planes.

Next month we'll take a trip over this line in the cab of a huge Diesel—all the points of interest will be shown

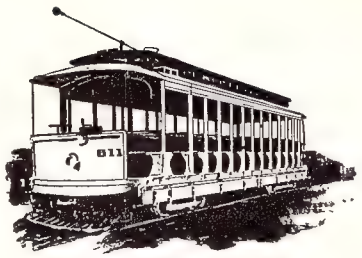
New Developments in RAILWAY MODELLING

REVIEWED BY BILL SCHOPP

I don't know who has been asleep at the switch, but I have never seen a review of the model railroad book by Rev. Beal, New Developments in Railway Modelling. This book, published abroad in April, 1947, sells for $3.75 in this country.

To my way of thinking, this book is the best ever published on model railroading with particular reference to HO gauge. It even exceeds the author's two previous books on the subject published before the war. Edward Beal's unassuming authoritativeness, his simplicity of style and his cleverness in the use of pen and ink drawings place him well ahead of any railroad writer on either side of the ocean. It is the most comprehensive book of its nature in spite of its natural bias toward British prototypes. Almost all of the matters discussed can be translated to American practice with a very little common sense and even those that cannot be are fascinating and make one wonder why HO railroading to British prototype is not followed in this country to any extent.

Early in the book, Beal announces his capitulation to two-rail and proceeds to expound two-rail to such an extent that it cannot help be clear to anyone who reads text and diagrams intelligently. Then follows a chapter on Layout Schemes for restricted spaces which contains several ideas that are now on this side of the ocean and are wonderfully developed. My only criticism of the Layout section is the seemingly free use of slip-switches.



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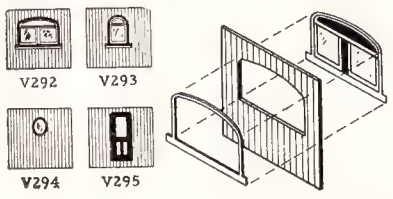

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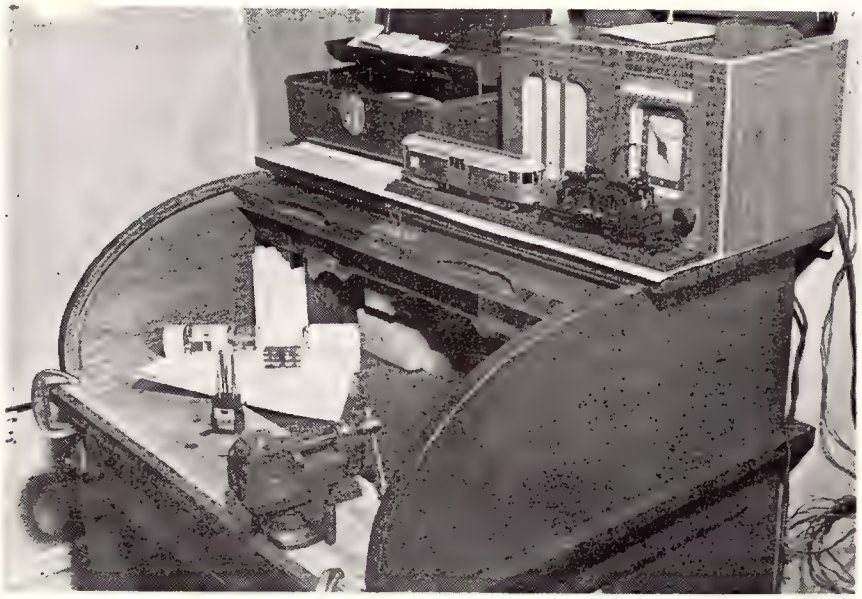

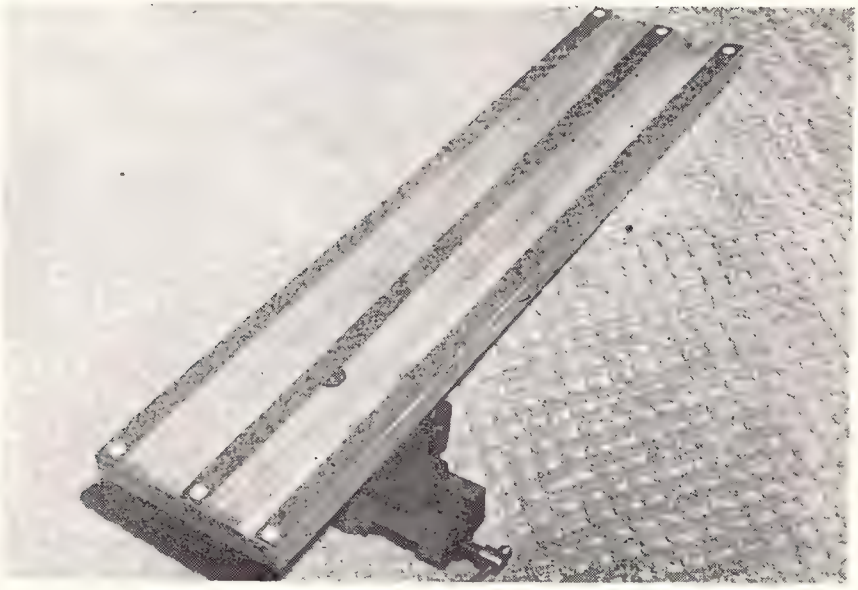

"Cubby Hole" MODELLING

By DAVID L. WADDINGTON

I live in a rented room, attending school away from home, and so the lack of work bench facilities threatened to make model building impractical. Some persons are content to be "arm-chair" fans but a true railroader will always find the means to pursue his hobby. The accompanying photos show just how this space problem was overcome—it was solved with the use of two C clamps and a portable working board.

This arrangement is superior to simply clamping a vise on to the writing desk since it protects the omnipotent landlady's furniture from marks and, in addition, the swivel base vise enables one to work on a piece from any angle, despite the restricted space. The foundation board is a 1" x 6" plank, cut for an easy sliding fit into the desk and given a coat or two of shellac. The holes for the vise bolts were counterbored from the bottom to bring the nuts flush with the bottom of the plans. As a further precaution against marring the desk top, three lengths of felt weatherstripping were glued along the bottom and secured at the ends with thumb tacks pushed in well.

The best location for the vise was found to be flush with the front edge of the board and well to the right side as shown. The vise is a "Yankee" Machinist's vise and is demountable from the swivel base for use as a drill press vise—in case I ever settle down and own one. A good quality vise such as this is essential if this bench arrangement is to give thoroughly satisfactory service. My only complaint against this particular model is that the jaws are not wide enough as in a conventional bench vise. They also don't permit holding long stock vertically when the vise jaws are swung at right angles to the front of the desk.

Notice the other photo which shows how the same two "C" clamps double to convert the desk for drafting purposes. In my case, such an arrangement is necessary since the T square was too long to go between the walls of the desk—in any event, this way provides more leg room and freedom of movement. Incidentally, in case you're interested, the two models shown are in "S" gauge.

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(*Continued from page 47*)

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RAILROAD CLUB NEWS

(*Continued from page 3*)

trips over various Colorado roads were shown—all in all, a very enjoyable evening was had by all.

The Bay Ridge Society of Model Engineers is engaged in a major reconstruction job on their engine terminal. This means the installation of a new turntable, lead tracks and servicing facilities for both steam and Diesels. Repairs are being made to the roundhouse and a new Diesel shop is in the works. This shop is necessary as the motive power roster lists four A units and three A & B units powered in each unit and an A & B passenger Diesel. The passenger Diesel is in Class DP3 and the others are in Class DM2. The DM2 class are used in mixed service either passenger or freight. In the meantime, the club's steam power is not being neglected. At least a half dozen of them are being added to the present roster of 31 engines—both steam and Diesel.

The boys have had several inquiries as to when another show will be given—this from persons who attended the last one is very encouraging. The matter of holding another show will be discussed at an early meeting. Several memberships are open in this active club for a couple of bonafide model railroaders; if you're interested, get in touch with the Secretary, Ed. Hoehn, 7101 Fourth, Bklyn. 9.

JACKSON, MICH. The Central Michigan Model R. R. Club layout is now under construction and operates every Thursday evening. With point to point operation, the layout now has 500 ft. of mainline track, 70 powered switches and six panels for control. Twelve locos and about 165 freight and passenger cars roll along the right of way which is complete with signals and interlocking. Membership is by selection only, the five present members all belong to the NMRA.

NEWARK, N. J. The boys of the Newark Model R. R. Club have been very busy the last few months getting the last of their roadbed down and the switches checked preparatory to the big job of wiring. Altogether there is about 600 feet of trackage on this OO gauge pike: a double tracked main line; a mountain line almost completely double tracked; a freight yard with a holding capacity of about 65 cars; and a passenger storage yard with a holding capacity of about 30 cars. The layout boasts a three-way wye that can be entered from any one of three directions, and an engine terminal, now in the works, that will hold 15 locos.

KINGSTON, N. Y. A gift to the Harrow Model R. R. of England, election of officers and the annual show report were on the agenda of the last club meeting of the Kingston Model R. R. Club.

The annual October show netted $277.29 with a record attendance of 1415. Future plans call for further expansion of the Hudson Valley Lines and the dispatching of an HO gauge Kasiner Streamline coach kit to the Harrow club as a gift. Club quarters are located at 541 Broadway and meetings are held Thursday evenings at 8. Visitors are welcome at any of the regular meetings.

PULLMAN OBSERVATION CAR

(*Continued from page 15*)

the same curve as the end of the roof and cementing them in place.

The air-conditioning strip to fit the roof can be purchased in the hobby store where you obtained the roof section. It is then just a matter of shaping the ends of the strips and cementing them in place on the roof. The ventilating screens are made simply out of a piece of gauze with a frame cut out of index card stock cemented to it. The ventilating fans are made out of wood with a bristol board fan. Two ventilators are made out of white pine. Cement these details in place and the roof is completed.

The underbody details are all made out of white pine. The shaded tanks are only rounded on the bottom. Do not use round stock but instead make the tanks square and then round the bottoms with a

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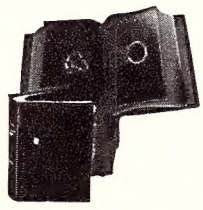

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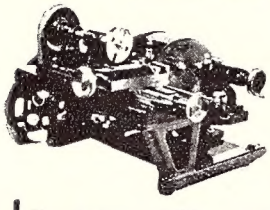

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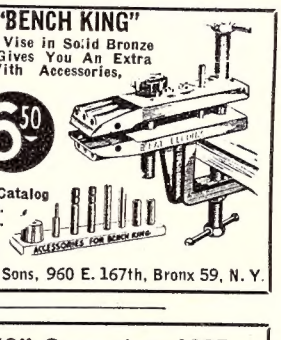

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plane. The doors on the boxes are cut out of index card stock and cemented in place. The center beam is made out of white pine with a strip of bristol board cemented along the bottom to make it look like a box girder. All that remains now is to put on the steam trap castings, generator and body bolsters. This completes the car body with the exception of the sides and blinds.

The sides are built up in the conventional way out of layers of bristol board. Use a sharp single-edged razor blade to cut out the window openings. The first layer of bristol board consists of the door and small openings which will represent the window sash. The next layer has the large window openings in it. Cement these two layers together and then cement a strip of bristol board above the top edges of the windows and another strip from the bottom edges of the windows to the bottom edge of the sides. The belt rail is a 1/16" wide strip of bristol board cemented along the bottom edges of the windows. Before going any further, paint the car sides. I used the new 410M railroad paints on my model with very good results. The sides and ends including the platform railings are painted Pullman green. The roof, diaphragm and underbody are painted dull black.

After the sides are painted, cement the celluloid behind the window openings and you are ready to make the venetian blinds. The slats for the blinds are made out of 1/16" wide strips of bristol board. Lay out the spacing of the slats (which is 1/16" apart) on a sheet of bristol board. Then cement the two tapes, made out of 1/16" wide strips of bond paper, to the layout. Do not cement the entire strip down, just put a small drop of cement at each end for the blind will have to be removed from the layout after it is assembled. Each slat is then cemented in place on the tapes. Cement on enough slats to cover the window opening for which the blind is going to be used. When the slats are all in place, bend the ends of the tapes around the bottom slat and cement them in place along the front of the blind. The blind can be removed from the layout by carefully sliding a thin razor blade between the tapes and the layout. Cement the blinds in place behind the window openings.

When the blinds are all in position, paint the back of the car sides black, leaving a quarter inch border around the edges so that the sides can be cemented to the car body. I cemented a piece of 1/16" thick balsa wood down the center of the car body up to the lounge so that you cannot see through the car. The lounge, of course, should be left clear as in the prototype.

Paint the car body dull black, both inside and out, with the exception of the ends and observation platform. Be sure to leave those edges unpainted to which the sides will be cemented. When the paint has dried, cement the sides in place, taking care that they are cemented down securely so that they do not warp later. Mount the type of couplers you use on the car and it is ready to roll behind your crack train.

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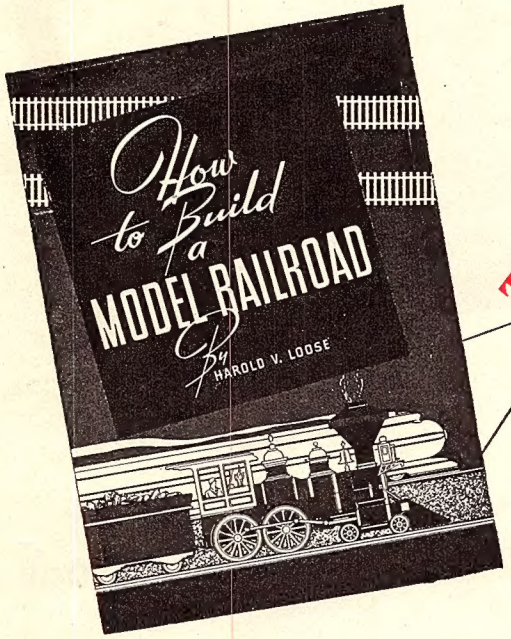

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